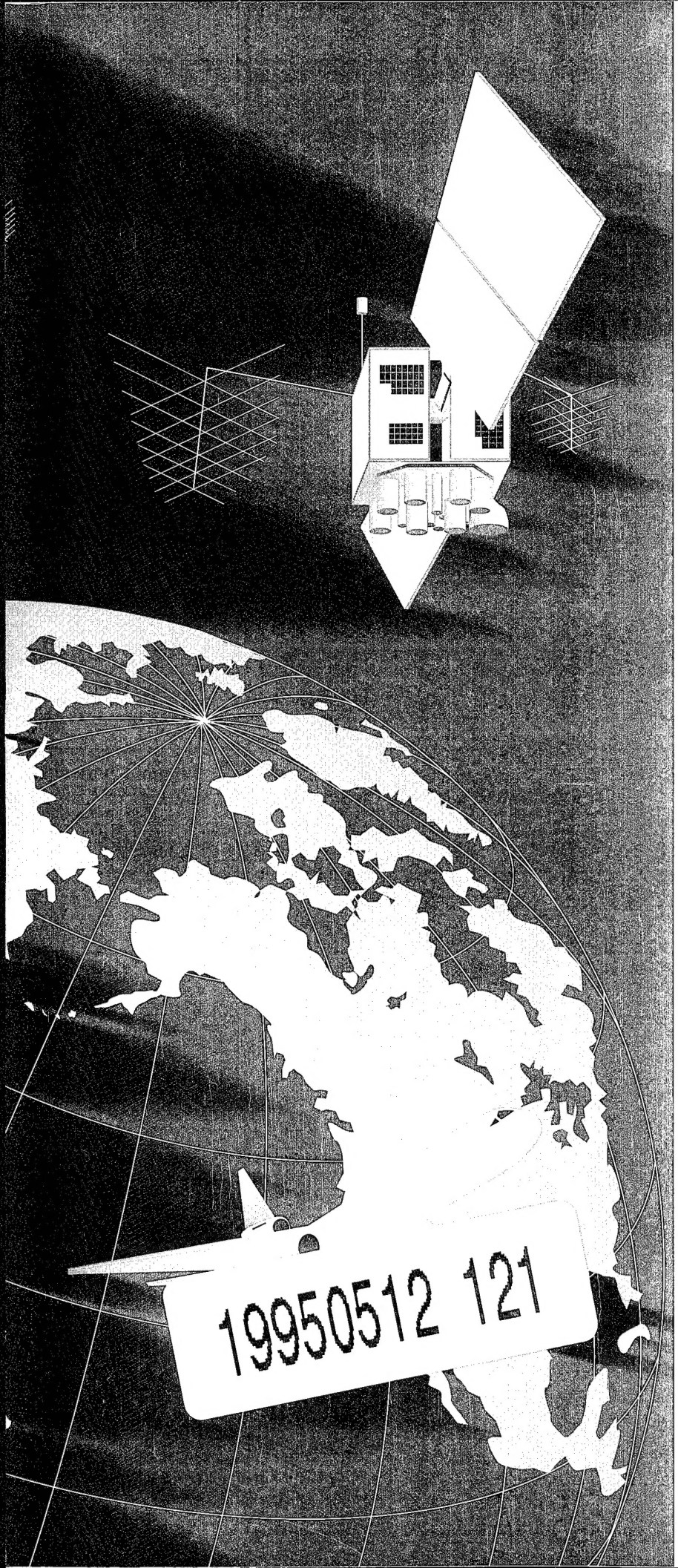


Federal Aviation Administration

Annual Report '94

U.S. Department of Transportation
Federal Aviation Administration

A Message from the Administrator

I am pleased to present the Federal Aviation Administration's (FAA) Annual Report for FY 1994. Along with a detailed accounting of our financial activities for the year, the report reviews our efforts to enhance aviation safety; modernize the air traffic control (ATC) system; and make the FAA a more efficient, effective organization operating with businesslike discipline.

Much of what we accomplished during the year were important milestone events as set forth in the agency's Strategic Plan. Our ongoing commitment to the plan involves a continuous process of critical appraisal. It has required the FAA to rethink its most established policies and re-examine its most longstanding practices.

Looking back on 1994, I see it as a year of conceptual innovation which brought new intellectual rigor to the analysis and understanding of our essential mission.

A TOUGH NEW LOOK AT THE ISSUE OF SAFETY

This past year, 555 million passengers boarded flights on U.S. carriers. This was 8 percent more than the previous year and double the rate of growth we had forecast. The principal drivers of this growth were a strong economy, low-cost airfares, and a safety record that is the best in the world. Indeed, air travel has become so commonplace and accidents so rare that people take for granted that the system is essentially risk-free.

Prior to the second half of last year, the major airlines had gone 27 months and carried 1 billion travelers without a single passenger fatality. Moreover, the number of accidents for commuter carriers in 1994 was the lowest on record.

But tragedy overshadowed these statistics. Last year, 264 people lost their lives in 7 fatal accidents.

This past January, Secretary Peña and I met with more than a thousand of the Nation's top aviation experts from industry. We considered the steps which must be taken if we are to reach our goal of zero accidents. The conference centered its attention on 45 safety issues which have since been translated into 173 high priority initiatives. These initiatives have now been integrated into a comprehensive Safety Action Plan. Throughout 1995, the FAA and the industry will be working together to put this plan into practice; two-thirds of the initiatives are scheduled to be completed by next September.

NEW HEADWAY IN ATC MODERNIZATION

Improved safety and our capacity to manage an increasingly crowded airspace are closely linked issues. Both require that our Nation's ATC system be able to exploit the ever-expanding potential of the latest technology.

The new system now under construction is not erected on the foundation of the old, but involves bold restructuring of our basic concepts of ATC and navigation. One core technology--the Global Positioning System (GPS)--did not even exist much more than a decade ago. Today, its deployment is progressing rapidly, in conjunction with other key components--data link and advanced automation.

During 1994, the FAA continued to make the momentous transition to this new generation of ATC technology, one which will serve aviation well into the next century.

This report reviews the year's progress in extending the use of GPS, in expanding the role of data link, in putting the Advanced Automation Program back on course, and in pushing ahead with Terminal Doppler Weather Radar and airport surface safety systems for the prevention of runway incursions.

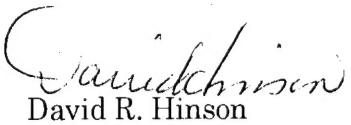
SHARPER DEFINITION OF WHAT WE MUST DO–AND HOW BEST TO DO IT

The complexity of our task requires an unprecedented level of managerial, as well as technical excellence at the FAA. During 1994, we clarified the structure of our organization in a way which will make it easier to manage our programs with the discipline of a well-run business. This was more than just a small adjustment or a minor shifting of resources. The entire FAA was given a more coherent framework corresponding to distinct lines of products and services.

This move was a response to declining budgets and a smaller work force. But while our resources are shrinking, our responsibilities keep expanding. As more people travel, there is an ever-growing demand for our services.

The times call for a clear definition of what is essential to our mission and an understanding of how best to focus our activities for maximum long-range benefit.

I believe the Annual Report for 1994 presents a forceful case that the FAA operates with a strong strategic sense of its priorities.



David R. Hinson
Administrator

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David Hinson
Administrator

Linda Hall Daschle
Deputy Administrator

Christopher Hart
Assistant Administrator for
System Safety

Mark Gerchick
Chief Counsel

Barry Valentine
Assistant Administrator for Policy,
Planning & International Aviation

A. Bradley Mims
Assistant Administrator for
Government & Industry Affairs

Sandra Allen
Assistant Administrator for
Public Affairs

Leon Watkins
Assistant Administrator for
Civil Rights

Monte Belger
Associate Administrator
for Air Traffic Services

Darlene Freeman
Deputy Associate
Administrator for Air
Traffic Services

- Air Traffic
  - AT Plans and Requirements
  - AT System Effectiveness
  - AT System Management
  - AT Program Management
  - AT Rules and Procedures
- Airway Facilities
  - NAS Transition & Implem.
  - Reqs. and Life Cycle Mgmt.
  - NAS Operations
  - Spectrum Policy and Mgmt.
  - Operational Support
  - Resource Management
- Capacity
  - System Capacity Planning
  - Aviation Weather
- Flight Inspection Program
- Independent Operational Test and Eval. Oversight

George Donohue
Associate Administrator
for Research and Acquisitions

- Acquisition
- Aviation Safety (Interim)
- Information Technology
- FAA Technical Center
- Aviation Research
- Air Traffic Systems
- Communications, Navigation and Surveillance Systems
- System Architecture and Program Evaluation

Tony Broderick
Associate Administrator
for Regulation and Certification

- Aircraft Certification
- Flight Standards
- Rulemaking
- Aviation Medicine
- Civil Aviation Registry
- Accident Investigation

Cynthia Rich
Associate Administrator
for Airports

- Airport Planning and Programming
- Airport Safety and Standards

Cathal Flynn
Associate Administrator
for Civil Aviation Security

- Security Intelligence
- Security Operations
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Dale McDaniel
Acting Associate Administrator
for Administration

- Budget & Accounting
- Human Resources
- Aeronautical Center
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March 1995

OVERVIEW

The Federal Aviation Administration (FAA) was created in 1958 to promote the safety of civil aviation and to foster air commerce. More than 48,000 career professionals are employed in the principal activities which support this mission: air traffic services; systems research and acquisition; regulation and certification; airport infrastructure development; civil aviation security; and agency administration.

In the past three decades, progressive and substantial improvements in Air Traffic Control (ATC) technology, training, airframes, engines, avionics, cabin interiors, and airport security have greatly reduced the risk of air travel. Today, passengers can travel by air more safely, and for less cost, than ever before.

And they are doing so in record numbers. In FY 1994, air travel on U.S. air carriers, regional and commuters increased from 513 million passengers to 555 million-- up 8.2 percent from the previous year and more than double the rate of growth which had been forecast.

Along with enplaning roughly 60 percent of the world's commercial air passengers, the United States also has the world's largest and most active population of general aviation pilots. Aircraft in this category range from the homebuilt, one-seat single engine piston airplanes to the most sophisticated long-range corporate jets and helicopters.

In FY 1994, general aviation accounted for 51 million operations at towered airports. Three U.S. general aviation airports -- Santa Ana, Long Beach, and Oakland, have more total operations than London's Heathrow.

The United States takes pride in the fact that our airspace is not only the safest in the world but the most heavily traveled as well. These achievements are linked, for a strong aviation sector depends on solid public confidence in the safety and integrity of the system. The mission of the FAA , from its founding , has been to promote American aviation by adhering to the highest attainable standard of safety. Every year, the FAA has raised that standard and during the past year, we added to our cumulative record of achievement. Our progress is documented in this report.

FY 1994 HIGHLIGHTS

Air Traffic Services. The FAA provides the aviation community with three distinct types of air traffic services: air traffic control tower services at 402 airports; traffic surveillance and aircraft separation by 22 air route traffic control centers; and flight planning and pilot briefings at 119 flight service stations.

The FAA's operational services are used by all four groups of aviation system users: air carriers, commuters and air taxi, general aviation, and the military. Services are available 24 hours a day, every day of the year, throughout the United States and its territories.

In March 1994, the ATC System Command Center was relocated from downtown Washington, DC, to larger quarters near Dulles International Airport. The new center, which tracks, monitors, and manages the flow of more than 150,000 flights a day, is a major step in boosting aviation safety, capacity, and efficiency.

In the fiscal year that just ended, FAA air traffic controllers at towered airports directed an estimated 60,296,300 take-offs and landings -- 188,000 more than in FY 1993. Instrument operations -- the most complex component of air traffic control -- increased by 2.2 percent to a new high of 46,712,700. Total aircraft operations handled by en-route centers rose to 38,840,000, up 3.7 percent from the previous year. Despite this increase in operations, system delays, excluding those caused by weather, continued to decline. The number of operational errors increased from 742 in FY 1993 to 805 in FY 1994. Pilot briefings, the filing of flight plans, and aircraft contacts by flight service

stations totaled 35.8 million, down from 37.2 million the previous year.

The FAA's airway systems specialists maintain a network of some 29,000 individual items of equipment for reliable, efficient navigation and for air traffic control. In FY 1994, the Airway Facilities organization installed 415 pieces of new equipment, including the nation's first Terminal Doppler Weather Radar, which can detect dangerous microbursts.

Research and Acquisition. The FAA's research and acquisition initiatives are aimed at accelerating the pace of ATC modernization, while advancing the frontiers of technology to achieve ever higher levels of safety, to increase the economic performance of the system, protect the environment and to serve national aviation needs, both now and in coming decades.

By the year 2005, the FAA will have invested some $32 billion in a capital investment plan to replace aging equipment and to upgrade and improve the entire air traffic control system.

Since the plan began in 1981, 85 percent of the initial-stage projects have been completed.

Many of the agency's research and acquisition products reflect the accelerated focus on three emerging technologies: Global Positioning System (GPS) for precision navigation, data link for error-free computer-to-computer communication, and advanced automation for maximum efficiency and productivity.

The GPS 24-satellite constellation became operational in December 1993. Since that time, the FAA has moved quickly to make GPS available to users in the U.S. and in other countries. As GPS is incorporated into the ATC system, air carriers will be able to benefit from more precise routings, fuel savings, and increased airport capacity in foul weather. All segments of aviation will benefit from the superior navigational and all weather performance capabilities of the GPS.

The single largest component of the FAA's modernization program is the development of an Advanced Automation System (AAS) to replace the computer equipment and work stations now used by air traffic controllers.

Since its start in 1988, however, the AAS has been beset by major cost over-runs and delays. In December 1993, FAA Administrator David Hinson ordered a series of independent reviews of the AAS. Two components of the program were canceled as a result of these reviews: the Area Control Computer Complex and the Terminal Advanced Automation System (TAAS). Other elements of the program were scaled back or modified. This overhaul places the AAS program on a solid, business-like footing.The TAAS component will be replaced by a new program which will emphasize the acquisition of commercial off-the-shelf equipment. The agency has designated this program as the Stand-Alone TRACON Automation Replacement System or STARS.

Regulation and Certification. The FAA's regulatory and certification authority covers virtually every aspect of aviation. Primary services include the certification of aircraft and avionics; the development of uniform standards, practices, and procedures; the licensing of pilots and flight instructors; the inspection of aircraft that enter or leave the United States or fly within its borders; the oversight of air carrier maintenance and operation; the promulgation of rules necessary to ensure the safety of air travellers, and the assessment of the safety oversight capabilities of countries whose air carriers fly into the U.S.

A major thrust of the agency's regulation and certification responsibility entails working with international civil aviation authorities to develop uniform sets of rules, standards and practices in order to ensure safe, dependable air travel throughout the world.

In the Fall of 1994, the FAA released the results

of its assessments of the safety oversight capabilities of 30 of the 93 countries whose carriers operate in the U.S. Nine countries did not meet minimum ICAO safety standards and their carriers were prohibited from flying into the U.S.

In other actions, aviation safety inspectors conducted over 3,000 inspections during the 1993-1994 winter season to ensure that airlines were complying with the rule requiring that aircraft must be free of frost, snow, or ice prior to take-off. Numerous studies were undertaken, ranging from determining cause of the failure in the Hartzell propeller to evaluating the safety of thrust reverser systems in the transport aircraft fleet.

Significant rulemaking in FY 1994 included two final rules designed to prevent alcohol abuse by personnel who perform safety-sensitive duties; a final rule requiring ample rest periods for flight attendants; and an interim final rule extending the deicing rule to Part 121 (commuter) air carriers.

The Aviation Rulemaking Advisory Committee, formed in 1991, is an active participant in the FAA's rulemaking process. The committees' 61 members, representing virtually every segment of the industry, recommended the adoption of new rules and the elimination or revision of old ones which they believe impose an unnecessary and costly burden on business.

The FAA also asked industry to identify the top three regulations they felt needed to be revised or eliminated. In all 167 comments were received. A disposition of comments has been prepared and will be released shortly.

Airport Infrastructure Development. In FY 1994 the FAA's airport planners processed over 1,300 applications totalling $1.69 billion for Federal Airport Improvement Program (AIP) grants-in-aid to improve and expand the nation's airports. Airport safety personnel inspected 570 airports for compliance with established standards.

The FAA recently announced the use of cost-benefit analyses to guide AIP capacity investment decisions. The agency is also exploring various innovative finance strategies to make limited AIP dollars go further.

Lack of capacity at the nation's largest airports is a growing concern. Many of these busy airports are hubs for commercial airlines, accommodate the heavy demands of general aviation, and provide operational bases for air cargo carriers. An FAA Capacity Council, co-chaired by the Associate Administrators for Air Traffic Services and Airports, has been formed to explore airport capacity initiatives and speed their availability to airport users.

Civil Aviation Security. The FAA's civil aviation security program exists to protect people, equipment, and cargo against criminal and terrorists attacks at airports or on board aircraft. The on-going efforts are to enhance explosive and weapons detection capabilities; increase aircraft resilience to explosives; oversee airport security systems; safeguard air traffic control facilities; improve the performance of passenger screening personnel; and the continuous assessment of threats to domestic and international civil aviation.

FAA Administration. The past year saw unprecedented change in the FAA organization as some 3,200 employees accepted buy-outs, early-outs, or left for other reasons. Still further attrition is planned for the coming year in accordance with the goal of the Clinton Administration to create a smaller, less costly, more responsive federal government.

The confluence of staff reductions, budgetary constraints and an ever-growing demand for FAA services led the agency to introduce, in December 1994, a more business-like alignment of operations along clearly-defined functional lines, clarifying critical chains of accountability. These changes will position the FAA to function with even greater effectiveness and productivity in the years ahead.

ON-BOARD FULL-TIME FAA POSITIONS
By Appropriation and Job Category

	FY 1993	FY 1994	CHANGE
Operations Appropriation			
Air Traffic	26,233	24,919	-1,314
Systems Maintenance	10,031	9,417	-614
NAS Logistics Support	1,299	1,208	-91
Aviation Regulations and Standards	5,490	5,144	-346
Aviation Safety	69	55	-14
Civil Aviation Security	831	772	-59
NAS Design & Mgmt.	556	512	-44
Airports	506	447	-59
Human Resource Mgmt.	1,429	1,163	-266
Direction, Staff & Support	1,058	916	-142
Chief Counsel	303	277	-26
Headquarters Admin.	463	445	-18
Total Ops Appropriation	**48,268**	**45,275**	**-2,993**
Facilities & Equipment	**2,270**	**2,117**	**-153**
R, E and D	**639**	**584**	**-55**
Reimbursable	**462**	**383**	**-79**
Total, All Appropriations	**51,639**	**48,359**	**-3,280**

And, to underscore the agency's continued commitment to diversity, the FAA has established a top-level position within the Office of Civil Rights to direct and coordinate its diversity programs.

THE U.S. AIR TRAFFIC SERVICES CORPORATION PROPOSAL

In May 1994, the Clinton Administration proposed shifting U.S. air traffic control responsibilities from the Federal Aviation Administration to a wholly owned government corporation that would be a financially and operationally independent organization within the Department of Transportation (DOT).

The proposal is consistent with similar recommendations made by the Clinton Administration's Initiative to Promote a Strong Competitive Aviation Industry, the National Performance Review and the National Commission to Ensure a Strong and Competitive Airline Industry.

Under the proposal, an estimated 40,000 employees who operate, maintain, and modernize the air traffic control system would transfer to the U.S. Air Traffic Services Corporation (USATS). Some 8,000 employees would remain in the FAA where they would continue to be responsible for aviation safety, regulation, and security.

USATS would be self-sustaining, primarily through fees assessed on certain users of air traffic services, and could borrow funds from the Department of the Treasury and the private sector to finance capital expenditures. Unhampered by cumbersome rules governing procurement, financing, and personnel, USATS would be able to upgrade equipment much faster, to make more business-like investment decisions, and to hire people when needed.

The Administration plans to introduce the USATS legislation in early 1995. Several members of Congress are also expected to introduce legislation in the next Congress that address similar reforms for the FAA.

Whatever the outcome of these proposals, the FAA's commitment to the highest standards of safety and quality of service will remain as uncompromising and constant as ever.

THE EMERGING REALITIES

The number of domestic air travelers is set to reach 800 million by the beginning of the new century. Within the next 20 years, the nation's air traffic control system, airlines, and airports can expect to handle a billion or more passengers a year.

Low-cost, low-fare air carriers are proliferating in the United States (as well as elsewhere), creating new markets for air travel. Among first-time U.S. fliers in the summer of 1994, roughly three of every eight flew on a start-up airline. Last year, 13 new Part 121 carriers entered the U.S. market. There have been 18 approved this year and other applications are pending.

The competitive challenge posed by the new airlines is having a far-reaching impact on the entire industry as older, larger carriers are forced to devise new strategies to maintain their positions in a growing domestic market.

While the domestic industry is undergoing changes of historic proportions, the growth of international aviation is of even greater consequence.

There has been an impressive increase in the number of transnational ventures both in aircraft manufacturing and in airline operation. The process of globalization is now well underway in the world's airline industry. Code-sharing, joint marketing agreements, cross-border investments and other initiatives are creating global networks designed to serve what has become truly global demand.

These momentous events helped determine the FAA's agenda, both for the past year and for years to come.

The annual report for FY 1994 presents a comprehensive overview of the agency's response to these pervasive trends, and it documents the huge scale of our day-to-day activities :

- in managing the safe, efficient flow of air travel through our nation's airspace,
- in performing the many thousands of regulatory actions and inspections which are necessary to maintain the integrity and reliability of the U.S. aviation system,
- in expanding the capacity of our airports, and
- in speeding the transition to the next generation of air traffic control technology.

Vice President Al Gore, DOT Secretary Federico Peña, FAA Administrator David Hinson unveil USATS proposal.

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CHAPTER 2

MISSION PREFORMANCE INDICATORS

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MISSION PERFORMANCE INDICATORS

OVERVIEW

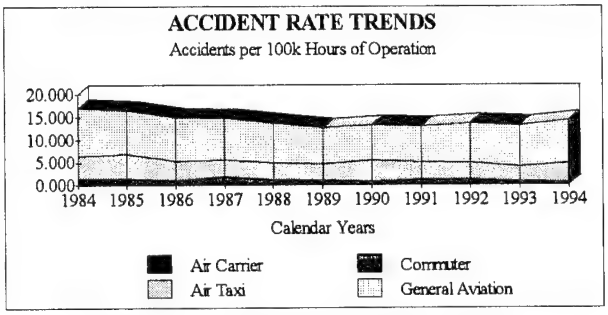
The Federal Aviation Administration has long recognized the importance of performance measurement and tracking as a management tool. While individual programs and projects are measured and tracked in detail by individual managers, the agency employs a series of agencywide performance indicators to present a more global view. These national measures give top agency managers a better picture of how all the programs are working together to improve the national air transportation system.

The agency's Executive Information System which has been operational since FY 1990 is the current vehicle for presenting and displaying both financial and agency performance level information for use by the agency's senior managers. The system is currently available to the Administrator, the Deputy Administrator, and all Assistant and Associate Administrators and their immediate staffs and is updated at least once each month to present the latest available agency information.

SAFETY

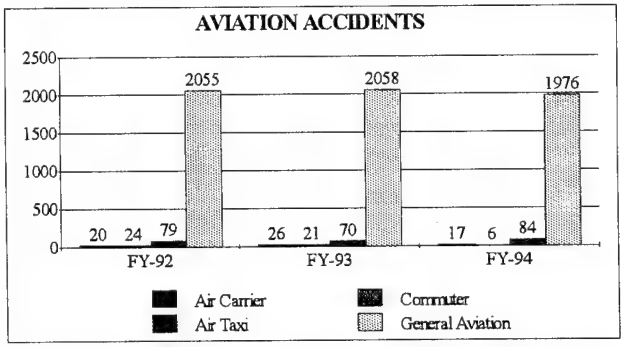
Safety is the first consideration in every program that FAA undertakes. A primary measure of FAA's performance in improving aviation safety is the accident rate. Rates are calculated per 100,000 hours of operation to normalize the number of accidents by level of exposure. Accident rates measure the culmination of the results of all of FAA programs taken together.

Improving aviation safety is a continuous objective of the FAA. Our current annual performance is better understood in perspective of the long-term trends in accident rates. The chart shows that the long-term trend for accident rates are downward, demonstrating continuously improving safety. Both the air carrier and commuter accident rates for 1994 were lower than in 1993. Air taxi and general aviation accident rates however, continued to increase slightly.



FY 1994 data are preliminary and subject to change

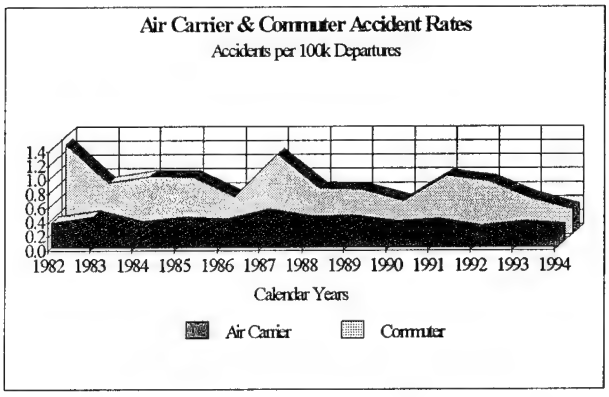
While accident rate per hours of operation is the most important measure of safety, FAA also closely monitors the absolute number of accidents to assure that the normalization by level of activity is not hiding a potential problem. For example, the number of general aviation accidents decreased from 2,058 in 1993 to 1,976 in 1994. The rate of accidents, however, was up from the previous year.



FY1994 data are preliminary and subject to change

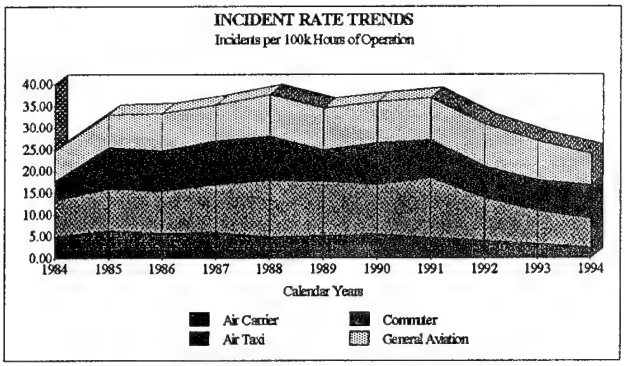
Notice the commuter accidents have declined from 24 in FY 1992 to just 6 in FY 1994. The commuter air carriers fly much shorter flights than the air carriers and traditional accident rates calculated per hours of operation often distort the relative safety between these two types of flying.

The following chart displays the accident rate trends for both air carriers and commuters in terms of accidents per departure. It can be debated that this is a better measure of safety since most accidents occur during take off or landing rather than during the cruise phase of the flight. This comparison shows that air carriers and commuters are very close, with air carriers at 0.25 accidents per departure and commuters at 0.35 in 1994. Also, note the continuous decline of the commuter rate. Since departure data is not readily available for the air taxi and general aviation, accident rates per hours of operation remains the standard for comparison across all types of flying.

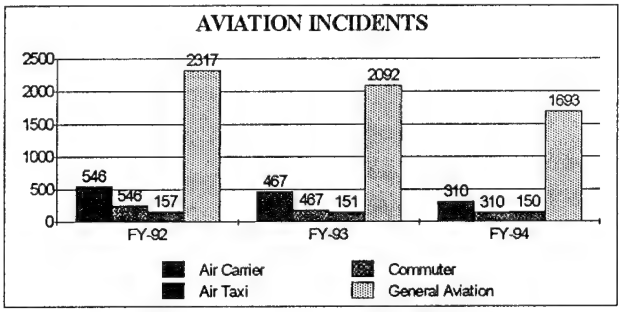


FY 1994 data are preliminary and subject to change

In an effort to identify potential problems before an accident occurs, FAA also tracks incidents or events that do not result in accidents but which may indicate less than safe conditions. As with accidents, incident rates are normalized by 100,000 flight hours as a relative measure of exposure. The chart below shows that incident rates declined from 1991 through 1994. The actual number of incidents also continued to decrease in each of these aviation categories.

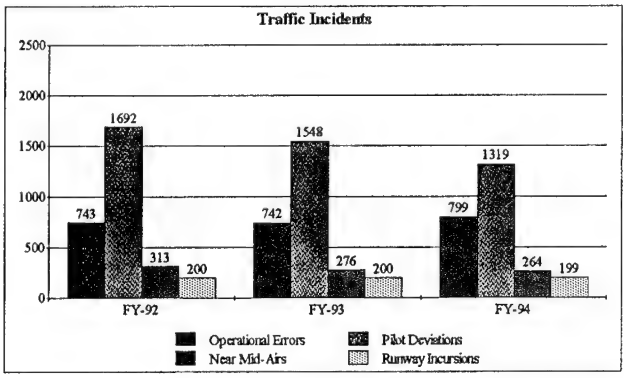


FY 1994 data are preliminary and subject to change



FY 1994 data are preliminary and subject to change

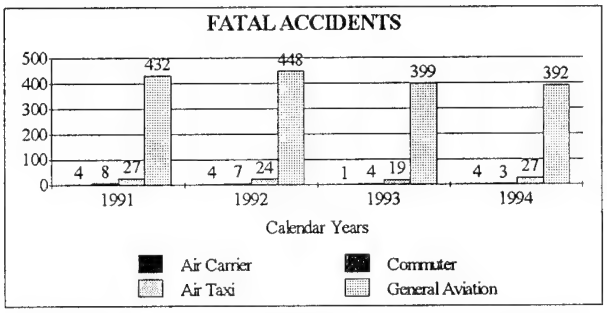
In addition to looking at incidents by segment of aviation, FAA also tracks traffic incidents such as operational errors (occurrences which result in aircraft in closer proximity to each other either in the air or on the airfield than allowed by FAA rules), pilot deviations (incidents where pilots failed to follow regulations), near midair collisions and runway incursions. The chart below shows the frequency of these incidents over the last three years.

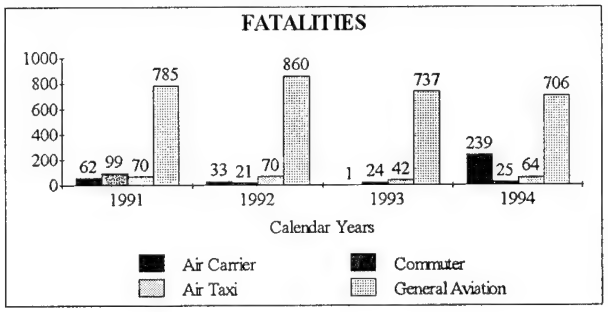


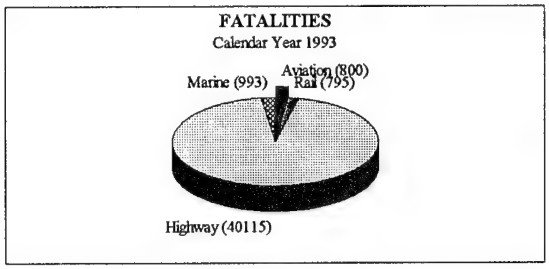
The Operational errors increased moderately in FY 1994, while Pilot Deviations and Near Mid-

Air Collisions continued to decrease. The number of runway incursions has remained near 200 for the last three years.

While FAA's focus is directed towards reducing accidents and incidents, we are also concerned about the severity of accidents. FAA has a number of programs which issue regulations and standards aimed at reducing the severity of injuries and minimizing fatalities. The charts below show the results of our efforts in this area, along with a comparison of aviation fatalities to other modes of transportation. Among aviation segments, general aviation still continues to have the largest number of fatal accidents. Air carrier fatal accidents are up from the record low year last year, to the same level as in 1991 and 1992. In 1994, commercial aviation experienced seven fatal crashes in which 264 people lost their lives. Prior to that time, the industry had gone 831 days without a passenger fatality. The FAA is committed to and aggressively pursuing objectives to achieve zero accidents.

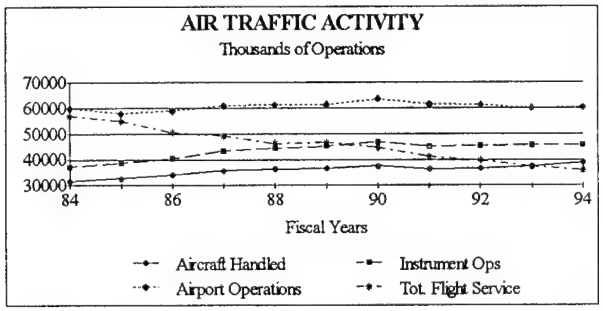






Efficiency of the System

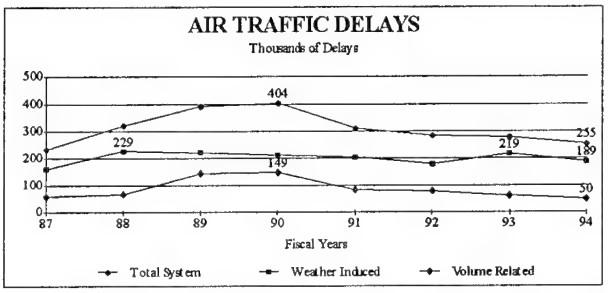
FAA monitors many measures of aviation activity. The measure of en route traffic is "Aircraft Handled" or one count for each flight handled by each center. Airport operations are the count of all takeoffs and landings at FAA-towered airports. Instrument operations are the count of aircraft using navigation signals and instructions from controllers. Instrument operations are measures of high altitude flying or flight in inclement conditions where radar tracking is involved. "Total Flight Services" is the measure of activity at flight service stations. It combines the counts of aircraft contacts with pilot briefings and flight plans using a formula.



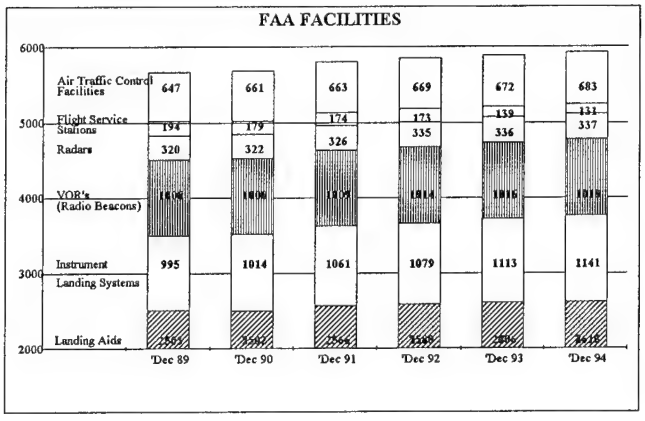
FY 1994 data is preliminary and subject to change

From the chart above we can see that airport activity has remained relatively constant for the past four years, while instrument traffic at both terminals and en route shows a modest increase. Activity at the flight service stations continues to decline as we implement other more automated ways of providing service to general aviation pilots.

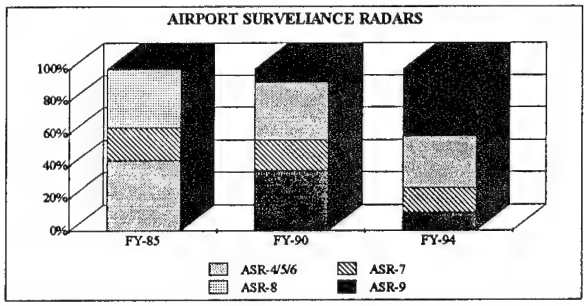
The aviation public regularly measures FAA's efficiency by the amount of delay. Not all of the delay experienced by airline passengers is attributable to the FAA system. FAA constantly monitors its performance in term of delays of 15 minutes or more attributable to the system. Weather accounts for more than 70 percent of all delays in the system. Weather induced delay remains relatively constant fluctuating around 200 thousand delays per year. Delays caused by the volume of traffic have decreased continuously since they peaked at 149 thousand. Total system delays have decreased by more than 35 percent since FY 1990.



One way to appreciate the size and complexity of the FAA air traffic system is through the chart below which shows the growth and relative numbers of the agency's major facilities. Most of these facilities operate around the clock, 365 days a year.



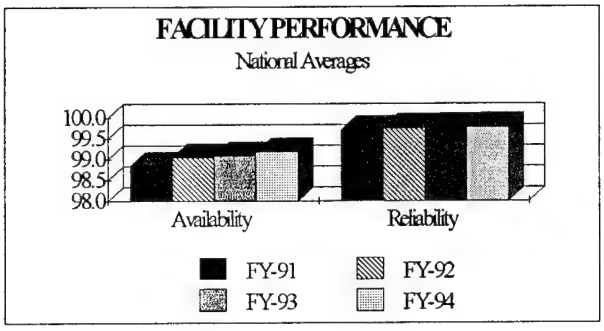
While the growth in terms of numbers of facilities does not seem dramatic, this growth has taken place while the maintenance staffing has been decreased by nearly 10 percent. The complexity of the equipment also continues to increase as we modernize the system. The following chart depicts the changing mix of technology as we modernize the airport surveillance radars. The ASR-9's radars now operate at over 40 percent of the sites and they didn't even exist in FY 1985.



Additional capital investment performance goals and measures are being developed with the cooperation of the heads of the newly restructured lines of business. Office directors and integrated product development teams within the agency's Air Traffic Services, Research and Acquisitions, and Regulation and Certification lines of business will include performance goals in the FY 1997 versions of the Facilities and Equipment (F&E) and the Research, Engineering and Development budget requests. Capital investment goals and measures will address the dual purposes of its F&E program, modernizing the air traffic system including capacity enhancement, and sustaining infrastructure. Performance measures based on those goals will be included in the agency's FY 1995 Annual Report.

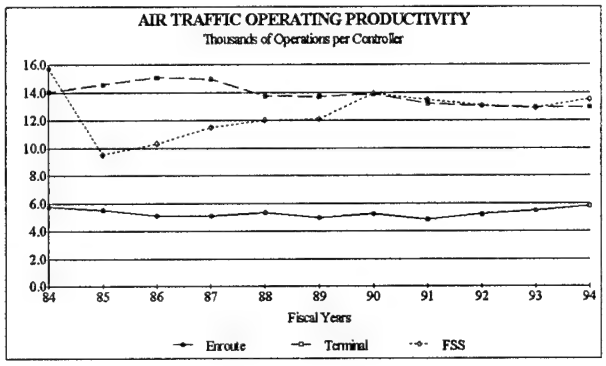
The facility performance graph measures reliability and maintainability. Sustaining or improving these indicators is certainly correlated to our goal of sustaining infrastructure. A sampling of other measures being considered includes: average age of equipment; average age of facilities; mean-time-between- failure rates; number of environmental cleanups completed versus number outstanding; ability to install and make equipment operational (inventory on hand vs. equipment installed); ratio of dollars spent

managing procurements vs. actual equipment cost; aircraft fuel savings realized; and capacity growth. These and other goals and measures will be considered, then narrowed to three to five that provide a high correlation to the agency's capital investment goals and provide the broadest applicability to our capital investment programs for inclusion in next year's annual report.



FAA measures the overall efficiency of the electronics in the system in terms of availability and reliability. Over 25,000 separate facilities are monitored. The reliability is a measure of the probability that the component will not fail, and availability is measured as the percentage of time a facility is available for use. National averages for both of these measures are presented in the chart above. While the national averages for both of these measures are extremely high, we continue to improve because FAA continually monitors these at the facility level and by individual types of equipment in order to isolate trouble spots.

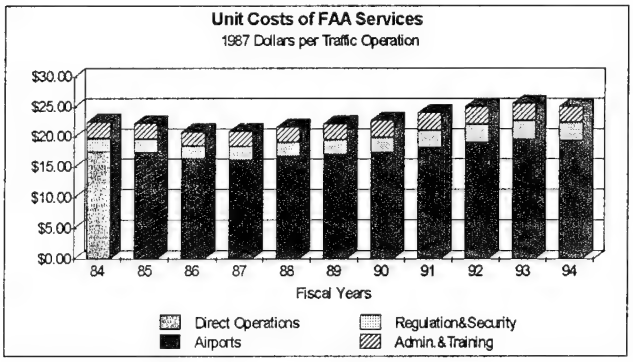
The amount of activity in the system is influenced by many economic factors. In fact, trends in aviation activity are sometimes used as a barometer of health of the economy because of the role that aviation plays in the transportation of goods and services and because of the number of U.S. industries involved in aviation. The industry includes not just carriers and airports, but also aircraft, electronics and computer manufacturers. FAA cannot control the impacts of the economy on aviation activity, but we do monitor our operating productivity despite changes in the activity levels. The following chart below presents the 10 year trends of activity per staffing for our air traffic control and flight service functions.

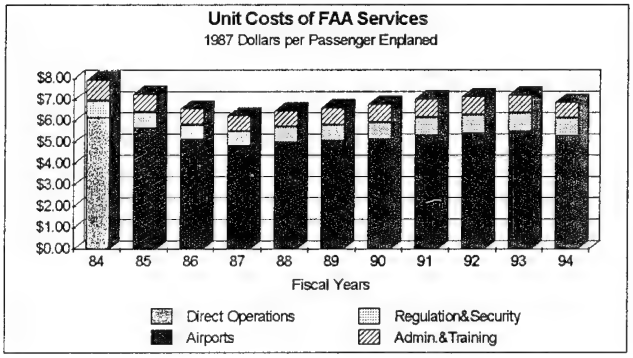


In the chart above we see a relative leveling of productivity at the terminals and flight service stations resulting from FAA staffing adjustments consistent with the changes in activity. The big decrease in productivity at the flight service stations in FY 1985 was the result of facility consolidations and it took until FY 1990 for the staffing to complete the necessary staffing reductions. The continuous increase in productivity at en route centers since FY 1991 is a result of FAA ability to hold staffing relatively constant despite moderate increases in traffic. Operations per controller is lower at our en route facilities because of the way in which we count operations. Operations are counted per facility and the en route centers cover a much larger area, therefore each operation may involve many more controllers.

Another way in which FAA measures its operating productivity is by looking at the unit cost of our service to the public. Unit cost per operation gives us a relative measure of our costs per aircraft flight. Unit cost per revenue passenger measures how we are serving the traveling public. To compare over multiple years we have converted our annual obligations to a constant 1987 dollar base. In the first chart, FAA Operations appropriation obligations are divided by the total operations count (airport + instrument + en route) to give a unit cost in

dollars per operations. In the second chart, the annual obligations are divided by the count of revenue passengers boarding planes to obtain a unit cost in dollars per passenger enplaned. Both charts show that in FY 1994 FAA actually decreased the unit cost of our services, reversing a trend of several years.

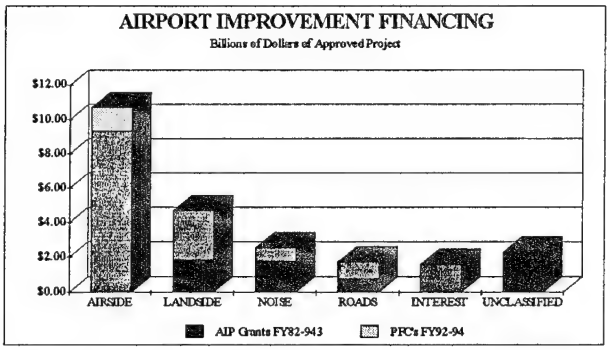




Airport Improvements

The National Plan of Integrated Airport Systems identifies approximately $30 billion in airport development projects eligible for Federal aid over the next 5 years. FAA plays a critical role in revitalizing and expanding the Nation's airport infrastructure. By authority of the Airport and Airway Improvement Act of 1982 as amended, the FAA issues grants to improve the airport safety, capacity, and service, and to reduce the adverse impact on the environment. In addition to direct grant authority for airport improvements, FAA has approval and oversight authority of passenger facility charges, authorized by the Aviation Safety and Capacity Expansion Act of 1990.

The following chart displays the allocation of the projects approved under both of these programs. Airside projects include improvements to runways, taxiways, aprons and equipment. Landside projects include improvements to the terminal building and security. The noise projects include the purchase of land and other soundproofing efforts. AIP grants are not used to pay interest incurred by the airport authority; however, this is an authorized use of funds collected as passenger facility charges. The unclassified is included for AIP funds which span multiple categories such as State Block Grants, Planning, and Land other than noise.



FAA's Office of Airport Programs is implementing more specific program performance measures and goals for FY 1995 in the areas of safety, security, preservation of the infrastructure, capacity enhancement and environment. The most significant of these measures will be included in next years report. FY 1994 and earlier grant and PFC information in that form is not readily available.

CHAPTER 3

FY 1994 FINANCIAL HIGHLIGHTS

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MANAGEMENT REPORT OF THE CHIEF FINANCIAL OFFICER

PROGRAM AND FUNDING CHANGES

FAA had to restructure its spending plans at the beginning of FY 1994 for several important reasons: (a) Congress appropriated $584 million less than we had requested thus requiring a number of major program changes and financial readjustments during the first months of the fiscal year; (b) the employee "buyout legislation" was not enacted until the second quarter of the fiscal year although that enabled us to implement our contingency plans to take advantage of this tool for downsizing our workforce by more than 3,000 people; (c) we encountered and dealt with major problems on the Advanced Automation Systems (AAS) which caused major restructuring of AAS funding; (d) the Vice President's National Performance Review (NPR) announcements of September 7, 1993, enabled a number of staffing and contract changes; and (e) numerous schedule changes for new equipment caused funding restructuring in both the Operations appropriation and the Facilities and Equipment appropriation. Details of the impacts of these changes are addressed elsewhere in the annual report.

Examples of reprioritization include reduced travel, fewer reassignments of personnel despite a need to balance workload, reductions in overhead staffing; increased spending on spare parts; and closure of Flight Inspection operations that had been based in Japan and West Germany.

FINANCIAL INFORMATION SYSTEMS

Further advancements have been made in the provision of financial information to agency managers. Improvements have been made to the Financial Information Management System (FIMS) and developmental work has been accomplished on a FIMS module that will provide users with information on the status of individual documents such as contracts and travel orders. Phase one of the Cost Activity Measurement System (CAMS) was completed providing a "proof of concept" of using available data sources to meet the FAA Strategic Plan objective of knowing the actual cost of the services we perform. As a result, the FAA Management Board authorized the start of CAMS phase two. Phase two will employ activity based management analysis to refine the unit cost computation process and to support business process reengineering (BPR) by identifying opportunities for enhanced efficiency and effectiveness.

TRUST FUND MANAGEMENT

The Executive Branch of the Federal Government believes that the costs incurred to provide National Airspace System (NAS) services be recouped from system users. Approximately 85 percent of total FAA costs can be attributed to private sector users of the NAS services and 15 percent to public sector users. Since FY 1991, Congress has authorized an overall 75 percent of FAA programs in total financed through the Airport and Airway Trust Fund (AATF), with the remaining 25 percent financed through the General Fund. The 1994 reauthorization lowered the AATF share slightly below 75 percent based on a formula intended to increase capital spending.

New receipts into the AATF in FY 1994 continued the increase that has characterized the trend for the past several years. Since FY 1989, the AATF user receipts have increased at an annual linear rate of almost $300 million. Over the same time period outlays (net payments of obligations incurred to carry out FAA programs) increased about $800 million annually--almost $500 million more than the annual increase in receipts.

Since FY 1991 we have been successful in reducing the surplus by more than $4 billion from $7.7 billion down to $3.7 billion. A one-time transfer of almost $1.8 billion from the AATF to the General Fund in FY 1993 also helped reduce the surplus as agreed by Congress in 1992.

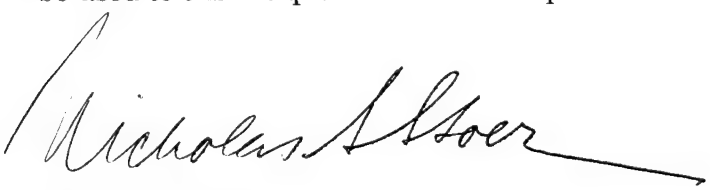
RECORD SPENDING ON FACILITIES AND EQUIPMENT (F&E)

A noteworthy financial management accomplishment is that actual obligations in our F&E appropriation in FY 1994 reached $2,759 million, an all time record of newly placed contract work. At the end of FY 1994 we had $4,552 million of work in progress in our F&E appropriation. This is having the effect of reducing unobligated balances in that program to $1,285 million. The agency projects that this balance will decline to $838 million by the end of FY 1996.

AUDITED FINANCIAL STATEMENTS

Consistent with the NPR BPR philosophy, a major change has been made to this report. Audited financial statements will be provided under separate cover after the Office of Inspector General has issued its report of audit and statement of opinion. Upon receipt, these financial statements can be placed in the pocket at the back of this report. This change has reduced the cost of financial statement preparation, provides recipients with audited financial statements more consistent with business practices, and allows earlier publication of this Annual Report.

Questions regarding this report may be directed to the Financial Information Division, AAA-500, 800 Independence Ave., SW, Washington, DC 20591. The comment card in the back of the report may be used to submit questions and to request addition to the list report recipients.



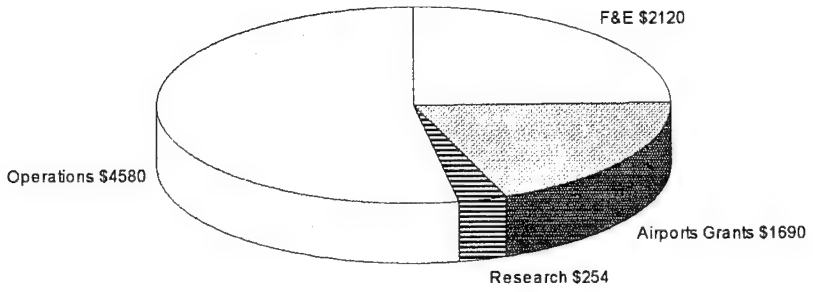
Nicholas S. Stoer

Chief Financial Officer

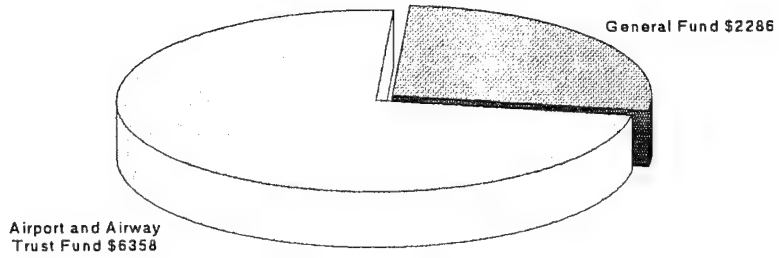
FY 1994 FINANCIAL HIGHLIGHTS

The FAA is financed through annual and multi-year appropriations authorized by Congress. The Airport and Airway Trust Fund provides for 75 percent of the congressional appropriations. The remaining 25 percent is derived from the General Fund of the U.S. Treasury. In FY 1994, more than $6.3 billion of the FAA's total budget of $8.6 billion. came from the Airport and Airway Trust Fund.

FY 1994 FAA BUDGET
Distribution by Appropriation
(Dollars in Millions)



FY 1994 FUNDING BY SOURCE
(Dollars in Millions)



Airport and Airway Trust Fund
Amounts Available for Appropriation
(Dollars in Thousands)

	FY 1994	Estimated FY 1995
Unexpended balance brought forward:		
U.S. securities (par)	$12,671,636	$12,206,426
Cash	178,158	179,781
Balance of fund, start of year	$12,849,794	$12,386,207
Cash income during the year:		
Government receipts:		
From excise taxes:		
Passenger ticket tax	$4,528,188	$4,829,280
Waybill tax	283,858	325,470
Fuel tax	187,163	195,120
F&E Offsetting Collections	55,631	121,176
R,E&D Offsetting Collections	94	1,549
International departure tax	218,117	233,180
Refund of Taxes	(28,060)	(21,300)
Reallocation from Trust Fund to General Fund		
Intrabudgetary transaction:		
Interest on investments	837,282	808,900
Total annual income	$6,082,273	$6,493,375
Cash outlays during the year:		
Federal Aviation Administration:		
Grants-in-Aid for Airports	$1,619,615	$1,785,000
Facilities and Equipment	2,378,107	2,019,000
Research, Engineering and Development	225,994	281,300
Operations	2,198,896	2,545,854
F&E Offsetting Collections	55,631	121,176
R,E&D Offsetting Collections	94	1,549
OST: Payment to Air Carriers	31,505	23,309
OST: GSA Rent	37,114	39,426
Total annual outlays	$6,546,956	$6,816,614
Balances Expired		($55,000)
Unexpended balance carried forward:		
U.S. securities (par)	$12,206,426	11,870,568
Treasury balance	179,781	137,400
Balance of fund, end of year	$12,386,207	$12,007,968
Obligated Balance	($6,028,491)	($5,948,158)
Unobligated Balance	(2,690,440)	(3,041,270)
Total Commitments	($8,718,931)	($8,989,428)
Uncommitted balance, end of year	$3,667,276	$3,018,540

ANALYSIS OF SELECTED FAA PAYROLL COSTS
(Dollars in Thousands Except for Costs Per Employee)

	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994
Total FAA Payroll Costs	$ 2,747,654	$ 3,001,383	$ 3,285,300	$ 3,525,121	$ 3,787,530
Average Cost per FTE	$ 54,076	$ 56,766	$ 61,393	$ 66,208	$ 73,891
FAA Contribution to:					
FERS Retirement	$ 111,054	$ 145,566	$ 153,878	$ 178,393	$ 197,643
1% Thrift Savings Program	4,647	6,818	7,683	9,111	10,084
FAA Matching, Thrift Savings	13,134	20,895	23,545	30,488	35,197
Social Security - FICA	51,708	49,722	56,366	72,421	73,622
Total FAA Contribution to FERS	$ 180,543	$ 223,001	$ 241,472	$ 290,413	$ 316,546
Number of Employees Enrolled in FERS	17,277	19,498	22,003	22,561	22,317
% FERS Costs to Total Payroll	6.57	7.43	7.36	8.24	8.36

% Growth in FERS Retirements costs FY 1990- to FY 1994: 75.3%

FAA Contribution to:					
Civil Service Retirement	$ 109,016	$ 112,942	$ 114,937	$ 118,224	$ 111,936
Medicare	25,957	39,609	39,600	44,430	43,507
Total FAA Contribution to CSR	$ 134,973	$ 152,551	$ 154,537	$ 162,654	$ 155,443
Number of Employees Enrolled in CSR	34,004	32,502	31,374	30,765	28,503
% CSR Costs to Total Payroll	4.91	5.08	4.7	4.6	4.1

% Growth in CSRS Retirement in FY 1990 to FY 1994: 13.8%

FAA Contribution to:					
Health Insurance Programs	$ 107,443	$ 116,171	$ 133,493	$ 140,302	$ 139,685
Number of Employees Enrolled	45,671	46,444	47,825	47,715	45,800
Annual Costs per Employee (In Dollars)	$ 2,352	$ 2,501	$ 2,791	$ 2,940	$ 3,050

% Growth in Health Insurance Costs FY 1990 to FY 1994: 30.0%

Source: Consolidated Uniform Payroll System

STATEMENT OF OBLIGATIONS INCURRED BY APPROPRIATION AND MAJOR OBJECT CLASSIFICATION

(Values Rounded to the Nearest Thousand)
Fiscal Year 1994

	Operations	Facilities and Equipment	R,E&D	Grants	Totals
Personnel Compensation	$2,796,794	$121,799	$38,006		$2,956,599
Civilian Personnel Benefits	706,889	37,984	7,468		752,341
Benefits for Former Personnel	59,134	2,653	1,565		63,352
Travel and Transportation of Persons	85,535	32,092	4,565		122,192
Transportation of Things	20,205	4,139	209		24,553
Rent, Communications, and Utilities	435,436	27,534	1,315		464,285
Printing and Reproduction Service	10,649	448	58		11,155
Other Services	395,183	1,339,762	162,008		1,896,953
Supplies and Material	86,617	52,770	3,155		142,542
Equipment	30,200	569,882	6,656		606,738
Land and Structures	635	244,689			245,324
Investments and Loans		4			4
Grants, Subsidies, and Contributions		38,660	31,441	$1,719,536	1,789,637
Insurance Claims and Indemnities	948	42	2		992
Total	**$4,628,225**	**$2,472,458**	**$256,448**	**$1,719,536**	**$9,076,667**

(Percentage Rounded to the Nearest Tenth)
Fiscal Year 1994

	Operations	Facilities and Equipment	R,E&D	Grants	Totals
Personnel Compensation	60.4%	4.9%	14.8%		32.6%
Civilian Personnel Benefits	15.3%	1.5%	2.9%		8.3%
Benefits for Former Personnel	1.3%	0.1%	0.6%		0.7%
Travel and Transportation of Persons	1.8%	1.3%	1.8%		1.3%
Transportation of Things	0.4%	0.2%	0.0%		0.3%
Rent, Communications, and Utilities	9.4%	1.1%	0.5%		5.1%
Printing and Reproduction Service	0.2%				0.1%
Other Services	8.5%	54.2%	63.2%		20.9%
Supplies and Material	1.9%	2.1%	1.2%		1.6%
Equipment	0.7%	23.0%	2.6%		6.7%
Land and Structures		9.9%			2.7%
Investments and Loans					0.0%
Grants, Subsidies, and Contributions		1.6%	12.3%	100.0%	19.7%
Insurance Claims and Indemnities					0.0%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

AIRPORT AND AIRWAY TRUST FUND

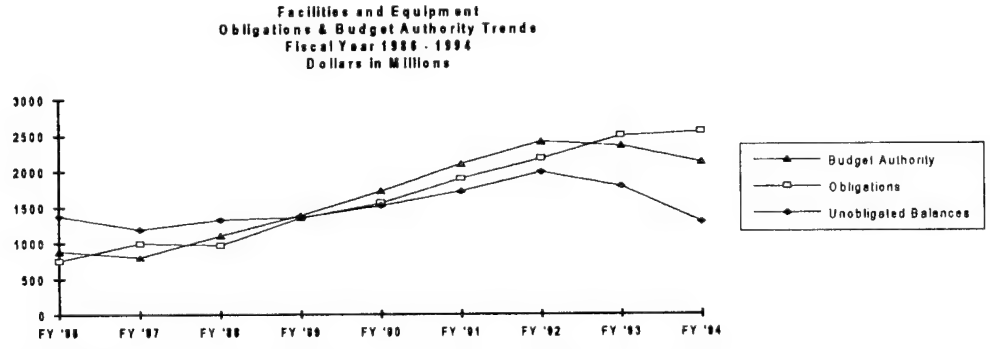
The Airport and Airway Trust Fund provides a stable source of funding for FAA programs, paid for by those who use the services. The Airport and Airway Development Act of 1970 (Public Law 91-258), as amended, provides for the deposit of certain aviation user fees in the Airport and Airway Trust Fund. In FY 1994, these fees included a 10 percent ad valorem passenger ticket tax, a 6.25 percent ad valorem freight waybill tax, and a general aviation fuel tax of $0.15 per gallon of gasoline and $0.175 per gallon of jet fuel.

The user fees are deposited into the General Fund of the U.S. Treasury for transfer to the trust fund. While held by Treasury, the funds are invested in Government securities. Any interest earned is deposited into the trust fund. Cash is withdrawn from the trust fund as it is needed and transferred into each FAA appropriation to cover necessary outlays. At the end of FY 1994, the fund contained a balance of more than $12.3 billion, of which $8.6 billion was committed or set aside to cover programs and grants underway. The uncommitted balance was $3.7 billion as of September 30, 1994.

The FAA's three trust fund appropriations: Facilities and Equipment; Research, Engineering and Development; and Grants-in-Aid for Airports receive 100 percent of their funding from the Airport and Airway Trust Fund. The FAA's needed capital investments are described in three regularly issued plans. These plans are the Aviation System Capital Investment Plan, the FAA Plan for Research, Engineering and Development, and the National Plan of Integrated Airport Systems. After the capital appropriations are funded, the trust fund pays a portion of the FAA's operating cost. Since 1991, the Operations appropriation has received approximately 50 percent of its funding from the trust fund and the balance from the General Fund of the U.S. Treasury.

The Airport and Airway Trust Fund also finances appropriations for the rental of Washington, DC headquarters and field space and related services administered by the General Services Administration and for the Essential Air Service Program administered by the Office of the Secretary of Transportation. In FY 1994 the trust fund contributed $37.1 million and $33.4 million, respectively, to these programs.

Facilities and Equipment (F&E) Appropriation - $2.12 Billion



Funds from the F&E appropriation are used to modernize, expand and replenish the air traffic control (ATC) infrastructure. Examples of F&E programs underway include the replacement of aging ATC computer hardware and software with a new Advanced Automation

System; a replacement of 1960's vintage Bell mechanical switches with a new Voice Switching and Control System which can be fully integrated with the new automated systems; and the installation of state-of-the-art long range and other radar. The Aviation System Capital Investment Plan (CIP) is the agency's primary mechanism for documenting current and future F&E requirements. The FY 1994 edition of the CIP describes some 190 near-, mid-, and long-term capital investment projects that will require funding from the Airport and Airway Trust Fund. CIP projects are estimated to average $2.3 billion-annually into the 21st century.

Each year, the FAA attempts to balance the content of the CIP to ensure that it is consistent with modern technology, acquisition policy, and funding constraints. The 1994 edition, for example, shows significant thrusts toward the civil application of satellite technology into ATC operations.

Capital Investment Plan Cornerstone Projects

Voice Switching and Control System (VSCS)	• Improves voice communications reliability. • Improves the voice communications system computer/human interface. • Improves communication flexibility.
Advanced Automation System (AAS)	• Increases traffic-handling capacity. • Improve computer/human interface. • Increases controller effectiveness.
Aeronautical Data-link	• Reduces communication errors. • Facilitates cockpit/ATC automation integration. • Facilitates a seamless domestic and international data communications service.
Weather Radar Program	• Enhances en route aviation weather products. • Facilitates safety and fuel savings.
Terminal Radar Digitizing, Replacement, and Establishment	• Improves weather detection in terminal areas. • Improves position accuracy. • Provides AAS compatibility.
Oceanic Automation Program (OAP)	• Improves communications and position reporting over the ocean.
Terminal ATC Automation (TATCA)	• Provides traffic management advisory tools in terminal. • Facilitates full use of terminal airspace capacity. • Increases safety and efficiency.
Airport Surface Traffic Automation (ASTA)	• Optimizes sequencing and scheduling. • Maximizes the use of surface capacity. • Increases controller effectiveness.
Integrated Terminal Weather System (ITWS)	• Integrate terminal area weather data. • Increases safety in terminal area.
Augmentations for Global Positioning System (GPS)	• Benefits aviation users. • Envisioned as the navigation system of the future with global application. • Potential for a complete radio navigation service for all phases of flight.

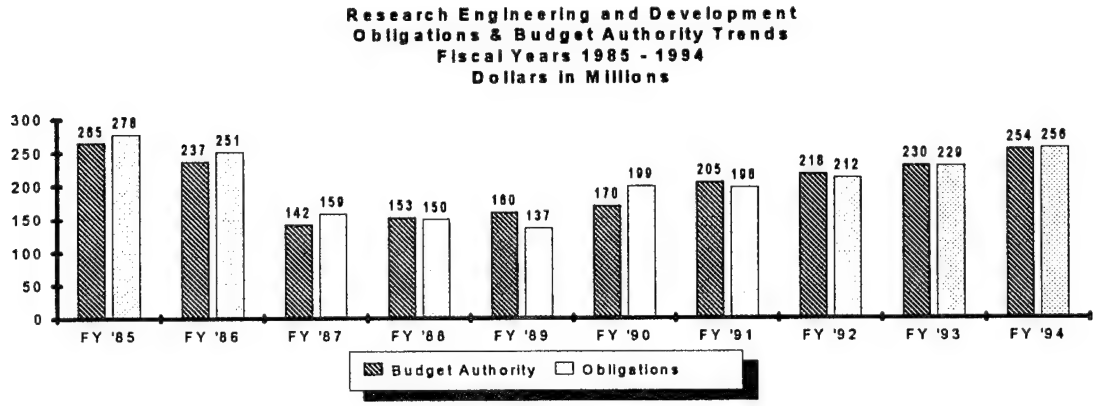
Source: 1993 Federal Aviation Administration Aviation System Capital Investment Plan

The F&E appropriation also finances other capital investments such as the purchase of aircraft for facility flight inspection and training and experimental facilities for engineering and development programs.

During FY 1994, the agency obligated 67 percent of the FY 1994 appropriation. This is the second highest obligation rate ever recorded during the first year of availability. The personnel and related expenses portion achieved a 92 percent first year obligation rate while the project portion achieved a 64.5 percent rate. For the second consecutive year, obligations exceeded the current year budget authority, thus significantly reducing the unobligated balance brought forward from prior years.

The FY 1994 Emergency Supplemental Appropriation Act (Public Law 103-211 dated February 12, 1994) rescinded $65.4 million from the (FY 1990 to 1993) Facilities and Equipment appropriation, $.8 million from the Operations appropriation, and $488.2 million from the Grants-in-Aid to Airports appropriation. The recisions were used to offset emergency financial requirements for California disaster assistance and Midwest floods.

Research, Engineering and Development (R, E & D) Appropriation - $254 Million

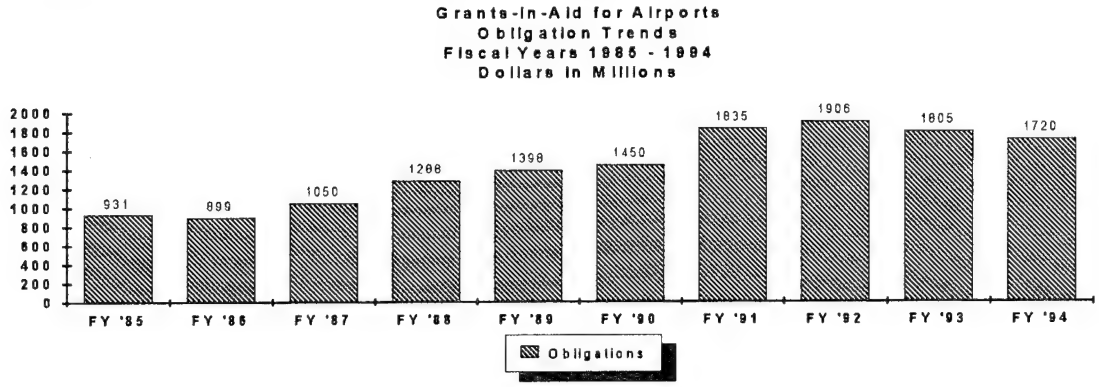


The FAA's R, E & D programs are directed toward improving safety, security, capacity, and efficiency in the National Airspace System (NAS). Projects such as Terminal Air Traffic Control Automation and the early introduction of satellite navigation capabilities will improve competitiveness of the U.S. aviation industry efficiency and cost effectiveness of the FAA.

Other key areas of concentration include human factors and aviation medicine research to improve efficiency and reduce the risk of human error by agency personnel and air crew members; development and testing of aircraft safety and fire protection methods; and studies to improve the environment through quieter engines and reduced aircraft emissions. FAA is also the leading Federal Government agency for the development of security and explosives detection systems.

The Research, Engineering, and Development Plan identifies new technologies for continuing improvements and to support the next generation of air traffic systems.

Airport Improvement Program (Grants-In-Aid for Airports) - $1.69 Billion

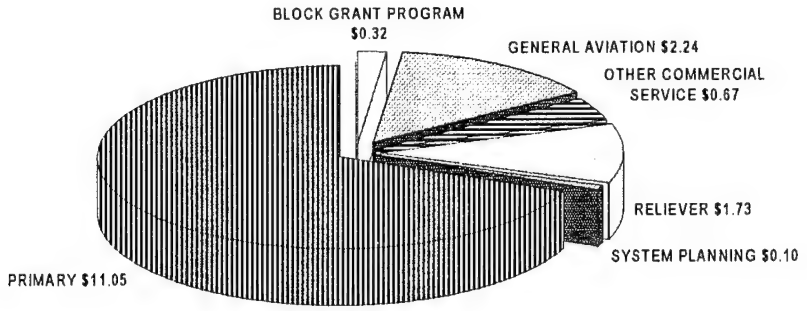


The payment of user fees to the Federal Government by air travelers and shippers contributes to the Airport and Airway Trust Fund and makes it possible to fund for one-fourth to one third of all capital development at the Nation's public use airports. Consequently, no Federal monies are withdrawn from the General Fund for federally assisted projects to maintain and enhance airport safety, preserve existing airport infrastructure, and expand capacity and efficiency throughout the airport system.

The National Plan of Integrated Airport Systems (NPIAS) draws selectively from local, regional, and state planning studies to estimate the costs associated with establishing a system of airports adequate to meet the needs of civil aviation. Costs identified in the NPIAS are nominally eligible for Federal grants-in-aid. Over the next five years, the cost of development needed to keep pace with growing aviation demands is estimated to be approximately $30 billion.

Despite a lapse of authority to issue Airport Improvement Program (AIP) grants for much of FY 1994, the FAA reviewed and approved more than 1,300 grant applications. In the process, FAA obligated $1.69 billion in new grants and increases to prior grants for airport planning and development. Of this amount, $354.5 million was invested in capacity enhancement, $224 million was for noise compatibility planning and projects, and $42 million was granted to foster civil aviation development at existing and former military airfields.

FUNDS ALLOCATED BY AIRPORT CATEGORY
(Billion of Dollars FY 82-94)



In addition to Federal grants under the AIP, commercial service airports have at their disposal a powerful financing tool in the passenger facility charge (PFC). First authorized in FY 1990, a public agency may impose a fee of $1, $2, or $3 on each enplaned passenger at any commercial

Continued on page 30

Grants-in-Aid for Airports Outlays by State / Territory

(Dollars in Thousands)

Fiscal Year Ending September 30

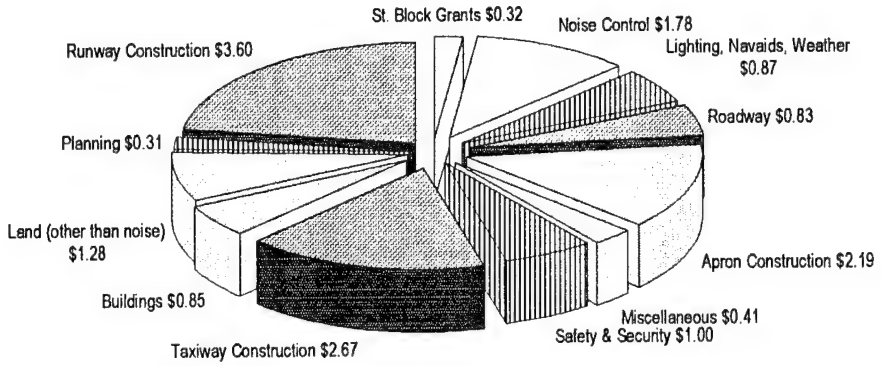
STATE / TERRITORY	1993	1994
Alabama	$ 23,849	18,904
Alaska	73,448	84,890
Arizona	46,560	28,451
Arkansas	14,081	6,310
California	125,845	135,880
Colorado	89,063	63,114
Connecticut	15,065	11,208
Delaware	852	286
District Of Columbia	226	151
Florida	103,831	104,486
Georgia	50,706	36,860
Hawaii	13,427	25,869
Idaho	11,550	8,862
Illinois	132,188	85,295
Indiana	32,182	16,786
Iowa	17,911	18,947
Kansas	19,627	14,885
Kentucky	46,402	26,957
Louisiana	44,339	24,132
Maine	11,408	8,481
Maryland	14,707	13,081
Massachusetts	35,834	16,914
Michigan	69,435	39,805
Minnesota	21,537	31,638
Mississippi	9,032	5,405
Missouri	23,497	38,715
Montana	14,821	11,185
Nebraska	11,575	12,525
Nevada	34,309	30,131
New Hampshire	12,750	13,724
New Jersey	15,096	21,318
New Mexico	27,622	13,545
New York	102,340	84,037
North Carolina	32,940	47,304
North Dakota	10,011	9,311
Ohio	67,832	36,252
Oklahoma	25,664	17,300
Oregon	19,172	16,102
Pennsylvania	62,171	51,653
Rhode Island	3,760	13,821
South Carolina	13,261	19,917
South Dakota	7,304	3,868
Tennessee	44,211	38,152
Texas	173,975	128,573
Utah	28,260	22,406
Vermont	1,020	3,380
Virginia	67,217	64,993
Washington	37,903	37,963
West Virginia	6,818	7,701
Wisconsin	22,937	20,176
Wyoming	14,064	7,947
American Samoa	727	1,685
Guam	2,589	4,232
Northern Mariana Island	2,957	4,356
Puerto Rico	15,467	6,381
Trust Terr Of Pacific	217	95
Virgin Islands	5,647	3,270
Total	$1,931,239	$ 1,619,615

service airport it owns or operates. Collections, which first began on June 1, 1992, now produce revenue for airports at a rate approaching $800 million per year.

Although these revenues are not considered Federal funds, the public agency's application to impose a PFC must be approved by the FAA. At the end of FY 1994, 203 such applications in excess of $9.2 billion had been approved.

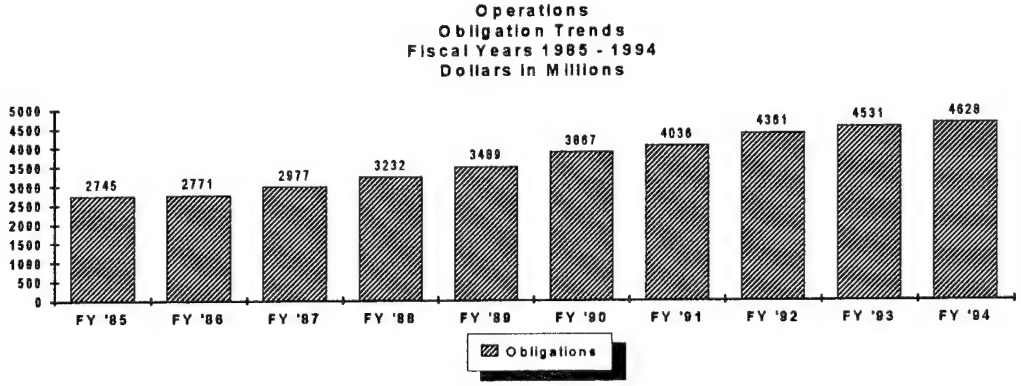
Projects funded with PFC revenue are in most respects similar to those funded with AIP grants. Use of the funds, however, is not limited by Federal priorities nor by limitations on AIP availability. Notable projects which have been made possible with PFC revenue include a major terminal expansion at Washington Dulles and a new runway at Dallas-Fort Worth, the latter an example of joint AIP-PFC funding.

FUNDS ALLOCATED BY WORK INCREMENT
(Billions of Dollars FY 82-94)



Operations Appropriation - $4.58 Billion

Funds from the Operations appropriation are used to pay salaries and other costs required to operate and maintain the air traffic control system on a 24-hour basis and to finance the FAA. Other mission-critical expenses financed by this appropriation include salaries and associated costs for: (1) the planning, direction, and evaluation of FAA programs; (2) engineering for the establishment of air navigation facilities; (3) the development of flight standards and civil



air regulations; (4) the promulgation of standards, rules and regulations governing the physical fitness of airmen, and the direction and administration of aviation research and development programs; (5) the administration of research and development programs; and (6) national integrated airport planning and the supervision of grants-in-aid for airport construction.

OTHER FINANCIAL PROGRAMS

Aviation Insurance Revolving Fund - $57.9 Million (Current Balance)

This self-sustaining program, authorized under Title XIII of the Federal Aviation Act, as amended, provides insurance coverage under conditions where commercial insurance is unavailable. Administrative costs for the operation of this program are recovered by FAA from fees and premiums charged to the carriers and interest earned through authorized investments. Examples of the use of this program include flights in support of humanitarian relief services in Haiti.

Aircraft Purchase Loan Guarantee Program - $10 Million (Public Debt Authority)

Under prior laws, the U.S. Government guaranteed private loans to certain air carriers for the purchase of aircraft and equipment. This program peaked in 1982 with 68 loans totaling over $659 million guaranteed by the Government. Authorization for guaranteeing new loans has expired and the current function of the program is to make payments to lenders in the event of defaults by air carriers. As of September 30, 1994, $4.1 million remains outstanding for guaranteed loans under this program.

Reimbursable Programs

The FAA receives reimbursable obligation authority to perform work for others in three appropriations: F&E, R,E&D, and Operations. Actual reimbursements in FY 1994 were $59.9 million for F&E and $2.3 million for Operations. The majority of FAA's reimbursable agreements are with other Federal Government agencies. The agency also enters into agreements with the International Civil Aviation Organization (ICAO) and with foreign governments. Examples of reimbursable work for other Federal agencies are joint-use radar sites with the U.S. Air Force (USAF) and purchases where it is more economical to make a single buy of similar equipment used by both the FAA and USAF.

ICAO agreements typically involve the training of foreign nationals at the FAA Academy. Direct reimbursable agreements with foreign governments generally are for the operation of civil aviation assistance groups in foreign countries.

FINANCIAL PERFORMANCE MEASURES

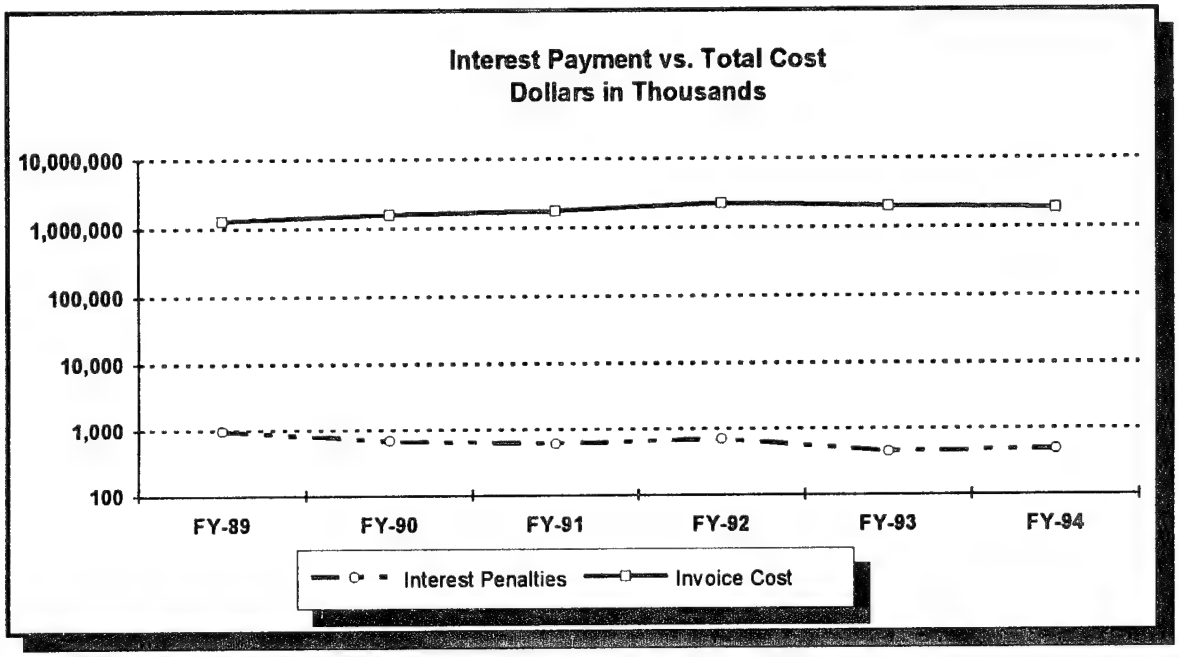
Cash Management

The Prompt Payment Act Amendments of 1988 set forth the requirement for penalty interest on late payments by the Federal Government. The interest expense associated with late payments is charged to the same appropriation as the original invoice; i.e., Operations; R, E & D; or F&E.

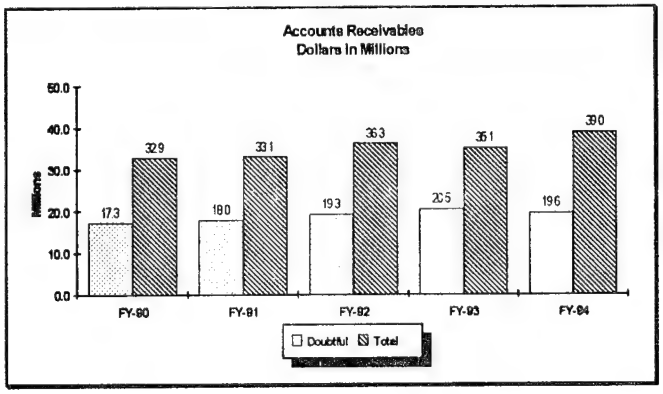
Despite the substantial loss of accounting personnel in FY 1994 as a result of increased retirements, late payment penalties increased only slightly in comparison with previous years. Increased retirements were precipitated by an offer of a buyout bonus of up to $25,000. About one sixth (17 percent) of an accounting work force of approximately 600 people were lost.

The focus of the accounting community in dealing with these staff losses is to assure that essential services are accomplished with minimal interruption. These essential services include: payment of commercial invoices in a timely manner so that interest costs are minimized; payment of employee claims for reimbursement of the expenses of official travel; and making the payroll every two weeks.

The chart below is a comparison of total dollars of interest penalties paid to the total dollar value of invoices processed. In spite of the considerable staff loss mentioned above, late payment penalties increased only slightly in comparison with FY 1993.



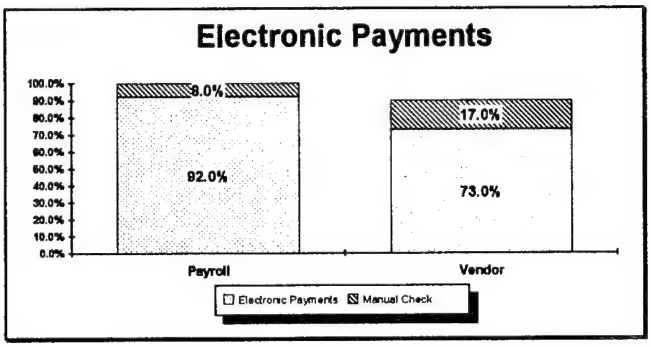
Debt Management



In FY 1994, FAA billed $32.4 million in new accounts receivable. During the same period, FAA collected $26.5 million in accounts receivable. FAA ended FY 1994 with $19.6 million in doubtful accounts receivable, which is 50.2 percent of FAA's total accounts receivable. Doubtful account receivable are those for which an allowance has been established by a management determination that collection is unlikely. Of the doubtful amounts, approximately 8.7 million is for fines and penalties due from airlines dissolved in bankruptcy; 9.2 million is due from airlines which have defaulted on aircraft purchase loan guarantees, and the majority of the remainder is due from foreign governments. FAA uses aggressive debt collection techniques including salary offset from Federal employees, use of collection agencies and consumer credit reporting services, and offset of Federal income tax refunds.

The chart shows the end-of-year status of FAA's accounts receivable for the years FY 1990 through FY 1994. FY 1994 total accounts receivable and allowance for doubtful accounts receivable declined in comparison to previous years because of an extraordinary one time reclassification of defaulted guaranteed loans that had previously been included in the accounts receivable amount.

Electronic Payments



The FAA currently uses two methods for electronic payments, Automated Clearing House (ACH) and FEDLINE, referred to as Electronic Funds Transfer (EFT). ACH payments are made electronically from the Departmental Accounting and Financial Information System through the ACH network for deposit directly into the designated bank account on the payment date. EFT payments are also deposited directly into the designated bank account. EFT is used by FAA for employee's salaries and to make payments of $25,000 or more to vendors. In FY 1994, 24 percent of FAA travelers received their reimbursement payment via ACH, 92 percent of FAA's 51,000 employees received their pay via ACH and 73 percent of the $2 billion paid to vendors flowed through EFT and ACH.

FEDERAL MANAGERS' FINANCIAL INTEGRITY ACT (FMFIA)

The FMFIA, promulgated in 1982, requires that all Federal managers establish and maintain adequate management control systems to protect the Government resources entrusted to them. Adherence to the principles of the FMFIA Program is the cornerstone to more effective and efficient agency operations. For that reason, a continuous emphasis is placed within FAA regarding the value of maintaining effective management controls in all programmatic, administrative, and financial areas.

Where a lack of adequate management controls results in resources being subjected to fraud, waste, abuse, or mismanagement, the resulting deficiency may be referred to as a material weakness or financial nonconformance. However, judgment should be exercised to ensure that only those deficiencies truly warranting the attention of the Executive Office of the President or the relevant congressional oversight committee are termed weaknesses or nonconformances. Their status then is monitored by the agency and included in an annual FMFIA report submitted to the Office of the Secretary (OST). This data then is incorporated into a Departmental report signed by the Secretary and forwarded to the President and Congress.

Annual FMFIA Report for 1994. In FY 1994, the FAA submitted an annual FMFIA report to OST certifying that the agency was in conformance with the requirements of the FMFIA. However, despite such assurance, it was necessary for FAA to report one material weakness in the Advanced Automation System (AAS) Program due to cost overruns, schedule delays, and the potential for conflict of interest in FAA's monitoring and management of the program. In addition, the Office of Management and Budget (OMB) determined that the AAS Program also should be identified as a high risk area. Continuous oversight by the Office of the Inspector General (OIG) was deemed necessary by Congress. Subsequently, the OIG has issued several management advisory memorandums and the agency is taking the corrective actions needed to achieve better cost efficiency and effectiveness in this highly visible program.

Corrected Weaknesses or Nonconformances. In FY 1994 the Office of Financial Management initiated new policy guidelines regarding the methodology for reporting weaknesses and nonconformances as corrected. On the basis of discussions that office held with representatives of OST, OIG, and OMB, it was determined that when enough corrective actions are completed to reduce the risk below the threshold of reporting to the President, a weakness or nonconformance can be reported as corrected. The agency made significant progress during FY 1994 on actions needed to correct seven material weaknesses and two nonconformances. As a result, FAA was able to report as corrected all previously identified deficiencies, with the exception of the weakness noted in the AAS Program. Specific improvements have been made as illustrated below:

- More effective management of national airspace system spare parts.
- Better policies and procedures for major systems acquisition.
- Compliance with laws relating to underground fuel storage tanks.
- Improved procedures for hiring and training air traffic and air safety personnel.
- Better monitoring of airport construction materials for conformance with approved standards.
- Better monitoring of airport sponsor compliance with Sections 511(a)(9) and (12) of the Airport and Airway Improvement Act of 1982.
- Significant progress toward achieving a strategic information resources management plan for FAA.
- In coordination with the Department, progress in developing a Departmental Accounting and Financial Information System (DAFIS) routine to separate prior year records from current year activities.
- In coordination with the Department, progress in developing a DAFIS routine to validate subsidiary ledger support for general ledger account balances.

Copies of the 1994 FMFIA Report to the President and the Congress may be obtained by contacting the Financial Programs Staff at 202 267-8040.

EXTERNAL OVERSIGHT

The FAA's programs are subject to audit by the General Accounting Office (GAO) and the Department of Transportation Office of the Inspector General (OIG). In FY 1994, for example, the GAO audited 29 FAA programs. The GAO conducts special audits at the request of Congress; however, the GAO may also initiate additional audits at its discretion. Reports of GAO audits and evaluations are issued at the national level. The OIG conducts internal, grant, and contract audits, and reports are issued at the regional, center, and Washington headquarters levels. The OIG also exercises oversight authority by conducting investigations of individuals or companies suspected of violating the law and complaints made to the OIG Hotline.

Audits of FAA Airport Improvement Program grants are conducted under the requirements of the Single Audit Act of 1984. This act states that any state or local government grantee receiving $100,000 or more a year in Federal funds must be audited annually by an independent auditor. The OIG provides technical advice to grantees and their auditors and ensures that the audits are accomplished according to established performance and reporting standards. Oversight is exercised through desk and quality control reviews of the independent audit work performed.

OIG contract auditing is an advisory service to contracting officers concerning the propriety of a contractor's cost. Most of this work is accomplished through a reimbursable agreement with the Defense Contract Audit Agency.

Significant GAO Audits in FY 1994

"Aviation Safety: FAA Can Better Prepare General Aviation Pilots for Mountain Flying Risks." General aviation accident rates are higher in western mountainous areas, particularly at a selected group of mountain airports, than other areas of the country. The FAA alerts general aviation pilots about the hazards of flying in mountainous areas during the pilot certification process and at subsequent safety seminars.

"Aviation Security: Additional Actions Needed to Meet Domestic and International Challenges." FAA has taken important steps in response to the Aviation Security Improvement Act of 1990 including placing airport security coordinators at key airports, assessing potential vulnerabilities, and issuing new requirements for freight forwarders. Additional challenges remain in areas such as human factors, continuous procedural improvements, and ensuring that available security information reaches those with a need to know.

"Aviation Security: Development of New Security Technology Has Not Met Expectations." FAA is pursuing several technological strategies to improve aviation security which includes conducting research and testing equipment to provide superior capability to detect explosives in baggage and also to improve aircraft survivability in the event of an explosion. Efforts in both of these areas are likely to approach implementation within the next several years. GAO also reported that the financial burden of procuring what is likely to be expensive new equipment could impose additional financial strains on the airline industry.

"Airport Improvement Program: Reliever Airport Set-Aside Funds Could Be Redirected." The FAA does not consider general aviation to be a significant factor in congestion at commercial airports today and still plans to continue to designate 5 percent of all Airport Improvement Program funds to add to the $2 billion already set aside since 1982 for reliever airport projects.

"Airport Improvement Program: The Military Airport Program Has Not Achieved Intended Impact." Issues were raised regarding the extent to which airports participating in the program complied with legislative goals, the criteria FAA uses to make funding determinations, and the extent to which FAA has evaluated program results.

To obtain copies of these reports, call 202-512-6000. The first copy of any GAO report is free. Additional copies are $2 each.

OIG Audit of FAA's FY 1993 Financial Statement. Reconciliation and documentation problems discussed in the report sections on individual material weaknesses and other reportable conditions impaired the scope of the audit work for several material accounts. The OIG was unable to apply other auditing procedures to satisfy itself as to the fair presentation of these material account balances on the Combined Statement of Financial Position. Therefore, the scope of its work was not sufficient to enable the OIG to express an opinion on the FAA's Combined Statement of Financial Position as of September 30, 1993.

The OIG identified nine material weaknesses and five other reportable conditions in the FAA internal control structure, as well as three instances of noncompliance with applicable laws and regulations. The material weaknesses were related to: (1) implementation of corrective actions from last year's audit report; (2) support for the Work-in-Progress account balance; (3) capitalization of assets; (4) adequacy of

subsidiary ledger support in the Departmental Accounting and Financial Information System (DAFIS); (5) transaction posting to the Purchases-in-Transit account; (6) recording of financial statement adjustments in DAFIS; (7) physical inventory procedures; (8) accrual of yearend liabilities; and (9) calculation of the net position. The other reportable conditions involved: (a) capitalization of equipment purchases; (b) reporting of late payment interest and penalties; (c) retention of records supporting personal property cost; (d) reconciliation of subsidiary to general ledger account balances for real and personal property; and (e) recording of supplemental appropriations. During the audit, the agency took definitive actions to correct material weaknesses (4) and (7) and reportable condition (b). The three instances of noncompliance related to: (i) appropriation procedures; (ii) cost allocation instructions for "Other Ledger" account balances and operating expenses; and (iii) guidance for developing trust fund performance measures.

This is only the third year that the FAA has prepared an annual financial statement under the provisions of the Chief Financial Officers (CFO) Act, and only the second year that the financial statement has been audited. The identification of significant reportable conditions precluding issuance of an audit opinion has not been uncommon at other Federal agencies during the first several years of preparing and issuing audited financial statements. Compounding the problems accompanying implementation of the CFO Act, Federal governmental accounting standards and Office of Management and Budget reporting requirements continued to evolve during the last 2 years.

Other Significant OIG Audits in FY 1994

"Summary of the Audits of Property Acquisition and Relocation Assistance Payments." The audits concluded that the FAA's internal controls were adequate to ensure owners displaced by airport improvement projects were fully compensated for their property and there were no indications of fraud. However, the OIG determined the need for the FAA to improve the program economy by motivating airport sponsors to: (1) limit owner relocation and tenant rent and down-payment assistance to fair and reasonable amounts; (2) perform more comprehensive reviews of property appraisals; (3) better justify and document administrative settlements; and (4) better identify and eliminate other ineligible costs. Using statistical sampling methodology to test $83.6 million of program costs incurred, the OIG concluded that $6.4 million of these costs were excessive. The FAA agreed to provide updated guidance to its field offices and to airport sponsors.

"FAA's Responsiveness to Suspected Aircraft Maintenance and Design Problems." The inspection concluded that the FAA's ability to identify, evaluate, and correct suspected aircraft maintenance and design problems is hampered by inadequate oversight of the FAA engineers' activities and decisions and insufficient analysis capability. This conclusion applies primarily to the FAA's Transport Airplane Directorate (TAD) which is responsible for addressing a majority of the reported aircraft maintenance and design problems. FAA agreed to develop a plan to address the OIG's recommendation of including daily alert bulletins, service bulletins, and direct contacts into the TAD's existing tracking systems. The FAA also agreed to develop and publish guidelines and procedures for engineers to follow in documenting research of suspected aircraft problems. At the FAA's request, the Aviation Rulemaking Advisory Committee accepted the task of reviewing the Service Difficulty Reporting (SDR) Program and a draft notice of proposed rulemaking for changes to the SDR rules has been completed.

"FAA's Surveillance of Foreign Manufactured Aircraft Parts." The audit concluded that although the FAA has established well defined supplier surveillance procedures, it has not followed the procedures in identifying

priority parts and in determining the need to perform surveillance of foreign suppliers. This condition exists because inspection resources are not available to identify suppliers of priority parts or perform surveillance of foreign suppliers to the extent required by the FAA's production approval and surveillance procedures. As a result, the FAA had no reasonable assurance that foreign manufactured priority parts were manufactured or inspected in accordance with applicable procedures or approved designs. The FAA agreed to determine the resources needed for performing surveillance over foreign manufactured parts and to seek legislative relief to enable the FAA to charge U.S. manufacturers for surveillance of foreign manufactured parts. The FAA does not agree that a material internal control weakness exists in the surveillance of foreign manufactured aircraft parts.

"Need for Operational Evaluation of FAA's Real-Time Weather Processor (RWP)." The audit concluded that the FAA has an opportunity to improve its major acquisition process by determining whether the weather radar mosaic products available from the agency's RWP prototype are suitable for operational use by air traffic management and flow control personnel at the FAA's en route centers. In OIG's view, the utility of the RWP products, developed at a cost of over $112 million, needs to be proven before any major changes in project direction are approved. The FAA generally concurred with the OIG's recommendations. Significant changes in the FAA's procurement strategy occurred subsequent to the audit. The FAA implemented an improved system of development and acquisition oversight that is intended to ensure delivery of a quality system within budget and milestone targets. Technical requirements have been validated, maximum use will be made of existing RWP prototypes, and fully operational testing will be conducted.

"Instrument Landing System (ILS) Program." Although FAA successfully awarded some contracts for ILS's, OIG determined that improvements are needed in the procedures for planning and acquiring ILS's. FAA could have made better use of more than $2.3 million in acquisition funds if adequate consideration was given to past acquisitions in selecting runway sites for replacement ILS's and capabilities for runway site to accommodate more sophisticated ILS's. Also commercial storage costs could have been avoided if FAA had better coordinated ILS site deliveries with installation plans. FAA agreed with the audit recommendations. Improvements will be made in coordinating the regions' ILS installation plans with contract delivery schedules. An automated ILS data base is under development, an assessment of runway sites planned for new category II/II ILS's was completed, and appropriate changes were made to the delivery schedules.

"Certification and Surveillance of Domestic and Foreign Repair Stations." The audit concluded that FAA has established an adequate certification process for new repair stations. However, the audit disclosed the use of aircraft parts of unknown design, quality, and origin; outdated repair manuals; substitute parts not approved by manufacturers; and parts repaired by subcontractors not approved by FAA. FAA strongly disagrees with OIG's conclusion that improperly documented parts or parts of unknown origin are widespread and with OIG's implication that the use of such parts may result in safety problems. Further, FAA does not agree that a material internal control weakness exists in FAA's repair station surveillance and regulatory structure.

FAA did agree to revise an advisory circular to include information and guidance for use in the determination of eligibility and traceability of aeronautical parts and materials for installation on type certificated products. Further, FAA agreed to revise the production approval and marking requirements of the Federal Aviation Regulations and suggested the development of a voluntary accreditation program for distributors and brokers. To better target repair stations for

surveillance, FAA agreed to redefine repair station ratings, identify safety trends, and train inspectors in areas of repair station weaknesses. FAA did not agree to require domestic repair stations to submit data regarding the volume or criticality of aircraft repairs. Although FAA agreed to require increased documentation of inspectors, FAA did not agree to assess repair quality or to test repair output.

"FAA's Management of Government Owned Vehicles (GOV)." The audit concluded that FAA needs to improve the management of the more than 4,600 GOV's leased from the General Services Administration. FAA's leased vehicles were underutilized, required usage records and vehicle retention justifications were not maintained or were not adequate to support retention, and controls were not adequate to assure that GOV's are not being used for unauthorized home-to-work travel. FAA agreed to issue guidance emphasizing the need to comply with and support FAA regulations on fleet vehicle management. Additionally, FAA is developing a motor fleet management information system. FAA disagreed that its management of GOV's is a material internal control weakness because the majority of vehicles are needed operationally and can be justified.

"Summary of the Audits of FAA Monitoring of Airport Revenues." The audits concluded that for the most part FAA was unaware that the airports reviewed by OIG were not as self-sustaining as possible and/or were diverting airport revenues. FAA agreed that its monitoring of airport revenues was not adequate. FAA will review, strengthen, and amend the audit procedures set forth in the Compliance Supplement for Single Audits of State and Local Governments, select annually a sample of airports for FAA review to determine if they are potentially in noncompliance and target these airports for OIG audit, and take corrective action for airports found in noncompliance.

"Parts Manufacturer Approval (PMA) Process." The review concluded that a systemic problem exists with replacement aircraft parts being produced outside the FAA established PMA process or one of the alternative approval processes. FAA's listing of approved parts manufacturers also was incomplete and inaccurate. Because of the significant ongoing initiatives by FAA to address deficiencies associated with the production and use of unapproved aircraft parts, a comprehensive audit of PMA's will not be made until FAA has fully implemented its new procedures. FAA agreed to take action to strengthen enforcement efforts and to develop better means for providing comprehensive information on PMA's. Guidance will be issued to FAA field offices reinforcing their responsibility to take enforcement action against entities producing aircraft replacement parts without the benefit of an FAA PMA or alternative approval. FAA will propose a Federal Register policy statement advising the public that FAA will make the enforcement of Federal Aviation Regulations section 21.303 a high priority. FAA will also consider including standardized evaluation criteria and statement of conditions regarding suspected unapproved parts in the next revision of the Aircraft Certification System Evaluation Program.

Other OIG Reports on FAA Activities. The OIG issues two semi-annual reports to the Congress listing their most significant work of the period. Copies may be obtained by contacting the OIG, Office of Program, Planning, and Oversight, JM-10, 202-366-2009.

CHAPTER 4

SUPPLEMENTAL PROGRAM INFORMATION

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SUPPLEMENTAL PROGRAM INFORMATION

FAA STRATEGIC PLAN

Events of the past year show that the FAA made significant progress in imposing the discipline of strategic planning on the enormous range and variety of agency activities. This annual report for FY 1994 documents that progress.

The FAA Strategic Plan for 1994, published in April, reflects the changing requirements of the aviation industry and the continuing trend toward smaller, more resourceful, more responsive government.

Developed in parallel with the DOT Strategic Plan, it incorporates recommendations of the National Performance Review and the Airline Commission, and the mandated requirements of the Government Performance and Results Act.

Strategic planning in the FAA is a continuing process, involving intensive internal and external consultations. Representatives of the industry have participated from the start, first in helping to formulate goals and objectives, then in evaluating the performance of the agency in carrying out the plan.

The overall aim is to transform the FAA into a customer-focused service organization dedicated to achieving seven key goals: increasing system safety, expanding system capacity, speeding the transition to the 21st century aviation system, promoting industry vitality, exercising international leadership, recognizing our environmental responsibility, and re-engineering the FAA to ensure its continuing effectiveness in a period of personnel reductions and budget constraints.

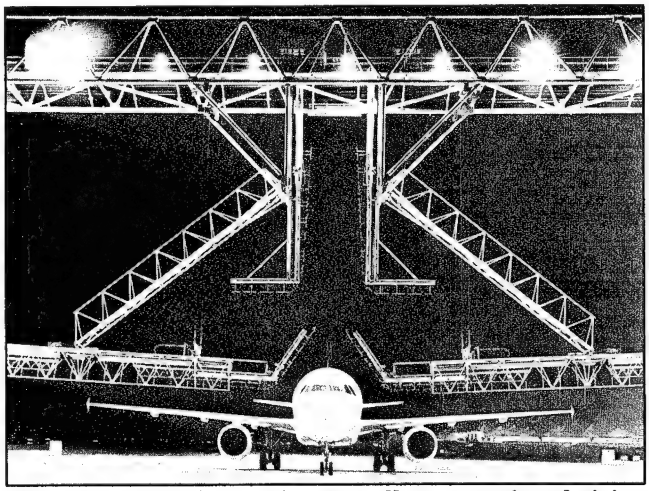
The profusion of projects and initiatives summarized and highlighted in this report demonstrate an underlying unity and coherence which can be traced to the growing influence of the Strategic Plan on the way the FAA does business.

SYSTEM SAFETY

Maintain high levels of U.S. and worldwide system safety while modernizing and handling increasing demand.

SAFETY THROUGH ASSESSMENTS AND INSPECTIONS

Deicing. The FAA took aggressive action during FY 1994 to improve the safety of winter flight operations for both FAR Part 121 aircraft and Part 125/135 aircraft. The FAR Part 135/125 interim final rule, "Training and Checking in Ground Icing Conditions," became effective January 31, 1994. This rule requires that commuter/air taxi air carriers operating under FAR Part 125/135 assure that aircraft are free from frost, ice, or snow. To ensure compliance with the new regulation, aviation safety inspectors conducted over 3,000 inspections during the 1993-1994 winter season. Advisory Circular 120-60, "Ground Deicing and Anti-icing



Centerpiece of the enviromentally protective de-icing concept at the Munich Airport is the "Gantry", located to the east of the southern runway. This computer-controlled gantry can completely de-ice a B-747-400 in just under five minutes. Contaminated run-off water is drained into catch basins from which it is then fed into a recycling installation. (Photo Courtesy of Flughafen Munchen GmbH)

Program" was published concurrent with the deicing rule.

Two contracts were awarded for research on the detection of ice contaminants and buildups on aircraft surfaces prior to flight. In addition, the

FAA is managing two projects funded by the Advanced Research Project Agency which pursue different technological solutions to the problem of ice detection.

The FAA continued its screening and assessment of commuter turbo-propeller aircraft which sometimes experience ice-induced tail plane stalls. Discussions are being held with manufacturers whose aircraft have been identified as being susceptible.

Technologies associated with ground anti/deicing fluids continued in FY 1994 to determine optimal application procedures, holdover time guidelines and associated aerodynamic effects.

Air Traffic managers participated in meetings with airport operators and users to achieve common solutions to local aircraft ground deicing problems. Air Traffic's emphasis was upon developing or enhancing local strategies to manage the number of aircraft in the departure runway queues and minimize the time an aircraft spends on the ground after being deiced.

Foreign Assessment Program. Since 1991, the FAA has been working directly with other countries on a cooperative basis to assess the safety oversight of their air carriers operating in the U.S. In FY 1994, the agency completed assessments on 30 of the 93 countries whose carriers operate in the U.S. Nine countries did not meet ICAO safety standards, and their carriers were prohibited from flying into the U.S. In September 1994, the agency began making the results of these assessments available to the general public so that travelers can reach more informed decisions about their choices of carrier.

The FAA expects to complete assessments on all 93 carriers by the end of 1996. The assessments are reported in the Consular Bulletins published by the U.S. Department of State.

Hartzell Propeller Accidents. In April 1993 a Hartzell propeller blade separated in flight, resulting in a fatal accident. This followed an earlier non-fatal incident involving a propeller from the same manufacturer. The two events led the FAA and the Hartzell Propeller Company to conduct a joint study to determine the reason for the propeller failures.

It was found that the most probable cause was fatigue which caused cracks in the inner propeller hub arm bore. Such damage can occur in certain aircraft when a particular propeller configuration and aircraft engine idle speed combine with certain wind conditions. Extensive inspections and reworking have been completed on virtually all the aircraft type (Mitsubishi MU-2B-60) involved in the two incidents. One hub crack and two propeller hub failures were found in over 474 inspections.

Thrust Reversers. FAA and aircraft manufacturers formed a safety assessment team to establish criteria for evaluating the thrust reverser systems of the current fleet of transport aircraft. To date, the team has reconfirmed that airplanes with aft-mounted engines are controllable following inadvertent inflight thrust reverser deployment. Generally, airplanes with wing-mounted engines need thrust reverser system corrections to assure that inadvertent deployment will not occur and adversely affect control.

Design reviews completed in 1994 have resulted in issuance of airworthiness directives that require installation of additional locking devices and other design improvements in thrust reverser systems on various models. Ongoing activity planned for 1995 targets the completion of necessary design improvements for the remainder of the transport fleet.

Airport Compliance Inspections. There were 570 airports inspected for compliance with 14 CFR Part 139 by the FAA's 35 airport

certification safety inspectors. Eight formal complaints were closed out with General Council approval.

Suspected Unapproved Parts. Flight Standards and Aircraft Certification continue to work aggressively to prevent and eliminate the use of suspected unapproved parts. Informing the industry of potential problems is still one of the best approaches available. To date, seven Airworthiness Directives and 38 alerts have been issued. As a further deterrent, the DOT Office of the Inspector General has been successful in obtaining a significant number of criminal prosecutions and FAA has initiated 35 enforcement actions.

Safety Performance Analysis System (SPAS). This program provides an automated decision support tool for Aviation Safety Inspectors and other Flight Standards personnel. The system gathers safety-related aviation information from up to 25 sources and flags potential problems to help safety inspectors focus their attention on certificate holders most in need of closer examination. The SPAS program will track the performance of certificate holders in four categories: Air Operator, Air Agency, Aircraft and Air Personnel. The first phase of testing has been successfully concluded and subsequently fielded at 29 locations, including one Department of Defense site. Current plans are to deliver the first operational version of SPAS I in 1995 to a limited number of users. SPAS 1 will remain operational until the release of SPAS 2 in FY 1997. It is anticipated that all Flight Standards and Aircraft Certification personnel will have access to SPAS 2.

Wake Turbulence Review. In 1993, two accidents occurred which were apparently related to wake turbulence. Both involved Boeing 757 aircrafts. The FAA established a study group to review the timeliness and adequacy of previous agency actions subsequent to similar incidents involving this plane. Since the release of the report in July 1994, the agency has adopted the group's key recommendations for improving safety:

- Reach and development has been integrated with the operating arm of the FAA, in order to more effectively resolve safety questions.
- An integrated safety data analysis center was established to expedite the flow of information on aviation safety to senior staff.
- A new Office of System Safety was established to provide the FAA Administrator with independent advice on safety trends and issues.

The FAA also is cooperating with NASA in research to provide a clearer understanding of vortex phenomenon and how it's dangers can be avoided.

Interim Report of the Safety Risk Management Team (SRMT). An interim report has been published which reviews how safety risk management is applied within the FAA and suggests opportunities for future applications. Recommendations included the establishment of a formal decision-making process which would employ a systems approach to risk management, integrate all system components, and be applicable across all program phases. Additional training in risk techniques and methods and a system for exchanging risk management information within the FAA was also recommended.

Aviation Safety and System Enhancement Team (ASSET). The National Air Traffic Controllers Association (NATCA) and FAA management have initiated a new team effort to reduce operational errors and enhance controller performance. During the past year, the team enlisted the aid of NASA and the University of Texas to examine various relationships between human factors and operational errors. The team proposed an innovative approach to investigation and assessment of performance during a loss of separation event.

ASSET has operated as a test program in six facilities in the Southwest Region since January 1994.

American Airlines Safety Action Program. In FY 1994, the Dallas/Fort Worth Flight Standards District Office (DFW FSDO) worked with American Airlines (AAL) and the Allied Pilots Association (APA) to establish a committee to review safety concerns or incidents reported voluntarily by AAL pilots. The team -- the first of its kind in the country -- examines each report and recommends corrective action to the airline, the union and/or the FAA. It may also recommend enforcement action to ensure compliance. The program is designed to complement existing approaches to promoting aviation safety. Excluded are intentional infractions of Federal Aviation Regulations (FAR) and serious safety problems that would be detected by the FAA through normal inspection procedures. There is no provision for immunity from FAA enforcement action.

SAFETY THROUGH RULE-MAKING

Alcohol Testing. On December 23, 1993, a final rule was published to implement alcohol testing requirements imposed by the Omnibus Transportation Employee Testing Act of 1991. The rule requires specified aviation employers to institute antidrug programs for personnel who perform safety-sensitive functions.

Alcohol Misuse Prevention. Another final rule, published February 15, 1994, prescribes regulations for establishing the aviation industry alcohol misuse prevention program. It includes requirements for an alcohol testing program for air carrier employees who perform safety-sensitive duties. The rule also requires alcohol testing of specified employees, prohibits certain alcohol-related conduct, and establishes specified consequences for behavior involving the misuse of alcohol.

Flight Attendant Duty Period Limitations and Rest Requirements. On August 19, 1994, FAA published a final rule setting forth regulations that require air carriers, air taxi, and commercial operators to limit the duty schedules of flight attendants and to provide ample rest periods. This rule contributes to aviation safety by reducing the likelihood that fatigue might impair the ability of flight attendants to perform their routine and emergency safety duties.

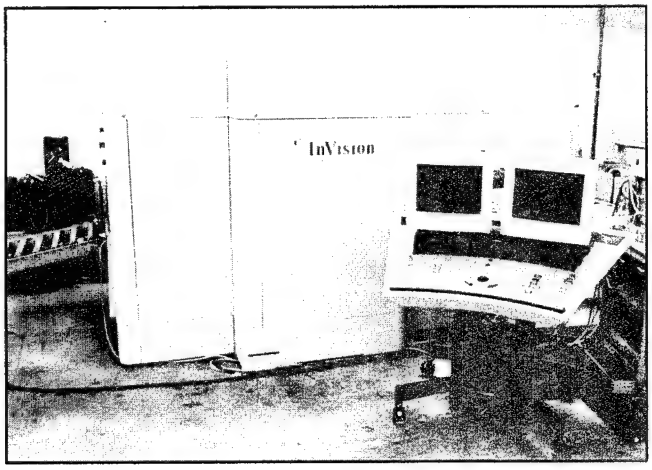
Air Tour Operators in the State of Hawaii. On September 26, 1994, a final rule was issued that establishes certain procedural, operational and equipment requirements for air tour operators in the State of Hawaii. This emergency rule was dictated by an increase in air tour accidents. The primary causes of the accidents ranged from loss of engine power to adverse weather. Among the contributing factors were: aircraft operating beyond their demonstrated performance envelopes, inadequate preflight planning for weather and routes, lack of survival equipment, and flying at altitudes too low to allow sufficient time for recovery or, in the event of power failure, to prepare for a forced landing.

Aging Airplanes. On October 5, 1993, FAA published a proposal that would: 1) require persons operating older airplanes to certify that certain airplane maintenance actions have been performed; and 2) allow the FAA Administrator to establish an airplane operational limit beyond which additional maintenance actions must be accomplished. This rulemaking project would implement part of FAA's Aging Airplane Program Plan and respond to the Aging Aircraft Safety Act of 1991.

SAFETY THROUGH RESEARCH

Research On Explosives and Weapons Detection

The FAA is the lead federal agency for the development of explosives detection systems (EDS). One system for the bulk screening of checked baggage was certified during the year and will be tested by three air carriers and two major airports. The agency also held airport demonstrations of two devices for detecting



New methods for screening checked baggage are one part of the FAA's security research program.

minute traces of explosives hidden in electrical appliances.

Other aspects of the agency's ongoing R&D program in aviation security include weapons detection, the safeguarding of air traffic and airport facilities, the design of hardened aircraft, improving the performance of airport screening personnel, and the development of a passive profiling technique for identifying domestic passengers for intensified screening. A prototype of the profiling software is being installed in the computer reservation system of one airline.

During the past year, the FAA has issued security requirements for all classes of cargo covering both direct and indirect flights by U.S. and foreign carriers. The agency also provided training materials for law enforcement officers who must travel armed on commercial flights.

The testing of the enhanced airport security system at Baltimore/Washington International Airport concluded, resulting in the publication of over 70 reports which are being made available to industry.

Research On Aging Aircraft

This research is directed towards enhancing aircraft and passenger safety by developing a better understanding of fatigue, crack growth and corrosion in aircraft structure. This pastyear:

- In cooperation with NASA, the FAA sponsored an International Symposium on Advanced Structural Integrity Methods for Airframe Durability and Damage Tolerance. The two agencies participated in joint programs on inspection research and conducted numerous technical workshops on structural integrity and maintenance. The "National Aging Aircraft Research Program Plan" was revised and published in October 1993.
- A prototype dripless bubbler ultrasonic inspection device for fast, convenient crack detection in fuselage skins was developed. The prototype was tested in the laboratory and a field demonstration was conducted at Northwest Airlines.
- A self-compensating ultrasonic technique for the detection of fatigue cracks and corrosion was developed. The technique was integrated with commercially available hardware and software and the resulting system was used in the laboratory to identify material thinning on manufactured samples provided by Northwest Airlines. Field prototype demonstrations were also conducted.
- Under an international agreement with Transport Canada, an enhanced visual inspection device for rapid surface corrosion detection called D-Sight was developed. The system was tested on the FAA/Aging Aircraft Nondestructive Inspection Validation Center (AANC) Boeing 737 and at Air Canada.
- Work was completed on a draft Advisory Circular on visual inspection. An appendix to Advisory Circular AC-43-4A, which identifies the best available corrosion prevention and control products and their commercial sources was also completed.
- A Damage Tolerance Handbook and accompanying video was produced for engineering and maintenance personnel. A prototype software package for analyzing and designing aircraft fuselage repairs, Repair Assessment Procedure and Integrated Design

(RAPID), was developed and demonstrated to potential users. This software package will provide the capability for a damage tolerance analysis of fuselage skin repairs.

- FAA personnel, along with personnel from the U.S. Naval Air Warfare Center, Aircraft Division Warminster, completed a two-week video landing parameter survey at Kennedy International Airport. Video images were recorded for 1030 landings; 35% were wide body, 35% narrow body, and 30% commuter.
- Baselining of the FAA B-737 aircraft located at the Aging Aircraft Nondestructive Inspection Validation Center (AANC) was completed. The baseline consisted of a comprehensive structural inspection of the aircraft fuselage and visual inspection of the wings comparable in nature and extent to an industry D-check or major overhaul. Over 700 flaws, mainly corrosion, were reported. The findings were carefully characterized and entered into the AANC sample database to be used in future validation activities.

Research On Accidents And Emergency Procedures

Child Restraint Devices. The compatibility of child restraint devices designed for automobiles, and certified by the Department of Transportation for use in aircraft was investigated. Rear facing infant carriers were found to provide better protection than forward facing carriers. The study raised questions concerning the safety of shield type booster seats in aircraft and revealed that in aircraft seats, children who are large enough to use boosters are equally well protected by the standard lap belts. A follow-up study is being conducted by the FAA's Office of Aviation Policy, Plans, and Management Analysis to determine the availability, effectiveness, cost, and usefulness of child restraint systems for use on aircraft. The study report will be submitted to the Congress in late February 1995.

Airliner Cabin Evacuation: International Focus. Cabin safety research is now coordinated among the FAA, Transport Canada and the European Joint Airworthiness Authority. The participants agreed to draw up a research plan and develop a risk analysis model. The joint effort will build on the cooperative research already underway in the U.S. and the U.K. This research is aimed at improving the role of cabin crew members during emergency evacuations and at devising a safe method for certifying compliance with the 90-second evacuation requirements. Joint research was also conducted using various computer models of the evacuation process.

Another series of evacuation experiments conducted by the FAA compared evacuation using escape slides with evacuation onto a platform. The experiments also considered the effect of exit height.

Evacuation methods are the subject of continuing FAA research

An analysis of data on the influence of anthropometric factors (age, weight, height, gender) on evacuation performance provides an empirical basis for selecting samples of human test subjects to be used in future evacuation experiments, and for evaluating the potential benefits of regulatory changes.

Alcohol and Drug Usage by Pilots in Fatal Aviation Accidents. New methods of analysis in forensic toxicology have improved the assessment of alcohol and controlled substances as causative factors in accidents -- as well as the causal role of pharmaceutical drugs and the medical conditions for which these products are used. For example, in an analysis of most (79%) of the fatal accidents which occurred in a 12-month period ending September 1994, alcohol (greater than or equal to 0.04 percent) was found to be present in about nine percent of the cases, prescription drugs in nine percent; over-the-counter drugs in 17 percent; and controlled dangerous substances in six percent.

Flight Data and Cockpit Voice Recorders. Six accidents have occurred worldwide since 1989 in which vital flight recorder data were lost due to the thermal degradation of the magnetic tapes. In FY 1994, the FAA conducted research to assure greater survivability of flight data and cock pit voice recorders subjected to intense and/or prolonged post-crash fires. Based in part on the completed testing, the FAA will propose new fire test certification criteria; viz, doubling the exposure time of the current fuel fire simulation tests, and adding a new fire test requirement to simulate a long duration, smoldering fire which may occur at a remote crash site.

Research On Fire Safety And Lightning Protection

Cargo Compartment Fires. Tests were conducted to determine the effectiveness of cabin flight attendants in fighting fires in the cargo compartments of commuter airplanes. Using flight attendant volunteers, it was found that unusually large quantities of the fire-fighting agent and ready access to the compartment was required to extinguish fires deep in the cargo area. Consequently, the FAA will now develop new fire protection requirements for the cargo compartments of commuter airplanes.

Fire test of a main deck cargo pallet loaded with representative cargo.

Halon Replacement Agents. Halon fire extinguishing agents are used extensively in commercial transport cargo compartment, engine nacelles, lavatory trash receptacles and portable extinguishers. But since it contributes to the depletion of the ozone layer, production of Halon ceased on January 1, 1994. Consequently, a test program was initiated to develop certification criteria for Halon replacement agents. An International Halon Replacement Working Group was created to provide industry participation in the program on a world-wide level.

In 1994 the FAA testing focused on cargo compartment fires where the vast majority of Halon is utilized. Water spray, pyrotechnically generated aerosol and a hydrochloro-fluorocarbon gas were evaluated. None of the replacement agents were as

effective as Halon. Additional development and testing of Halon replacements is planned for FY 1995.

Fire Resistant Cabin Interiors. Agreements with the University of Akron and Allied Signal Corporation have resulted in the hiring of three post-doctoral researchers to work on modified triazine resins as potential highly fire-resistant material replacements in aircraft cabin interiors. The new Kameleon Fire Model under development by the FAA and the Department of Energy has been applied to a complete aircraft fuselage placed in a large pool of burning aviation fuel.

In accord with National Research Council recommendations, the FAA has developed a program plan for the development of fire-resistant aircraft materials. In May, a patent was issued on an FAA-invented cabin smoke evacuation nozzle that provides vastly improved efficiencies during the rapid descent and airport approach of a jet during an in-flight fire emergency.

Atmospheric Electrical Hazards. Design and qualification procedures for lightning protection of aircraft fuel tanks was completed. Additional lightning strike data from CV-580 and F-106 aircraft were incorporated into the FAA's Research and Development Electromagnetic Database. To support design and certification requirements, an effort was begun to develop the High Intensity Radiated Fields (HIRF) electromagnetic environment in which general aviation aircraft and helicopter will operate.

Research On Human Factors In Safety

Human Factors Laboratory. During FY 1994, the FAA Technical Center's Human Factors Laboratory established a new simulation facility devoted to Human Performance questions. The first simulation experiment evaluated the benefits to controllers of a procedural memory aid for standardized approach and departure paths. Operationally qualified Atlantic City radar controllers worked simulated air traffic under various circumstances. In addition, a program was established in the laboratory to develop improved methods and measurements for the study of human performance in the air traffic control system.

Flight Crew Accident/Incident Human Factors Project. Five reports were issued in FY 1994 to support the development and validation of a process to access, integrate, and analyze human factors data relevant to aviation safety.

Screening tests and pilot performance: joint study with Russia. A joint research project is continuing with the Civil Aeromedical Institute (CAMI), Georgetown University, and a group of Russian scientists. The study is designed to determine the relationship between performance on the CogScreen test battery, age, and performance of Aeroflot pilots as measured by flight data recordings. A protocol for the study has been developed and data collection is underway with pilots flying into a Moscow airport. It is anticipated that data analysis and initial reporting will be completed during the first quarter of FY 1995.

Air Traffic Control and Pilot Communications. The Civil Aeromedical Institute (CAMI) has established a laboratory to study interactive communications between air traffic controllers and pilots. An innovative terminal radar control simulator is used along with pilot workstations and realistic air traffic control protocols to study the influence of faulty pilot communications, traffic densities and controller sector currency on effective voice radio communications.

Findings from the study will identify ways to reduce the frequency of miscommunications and errors in ATC/pilot voice communications. Follow-on studies will address the impact of data-linked communications when integrated with voice communications in the terminal radar control environment.

General Aviation Human Factors Research. The Civil Aeromedical Institute (CAMI) has developed a comprehensive general aviation human factors research program to obtain objective, scientifically-derived data to aid in certification and regulation, to identify affordable initiatives for reducing the number of accidents and incidents in the general aviation community, and to aid in the design of innovations for enhancing GA pilot performance under non-routine flying conditions. A research program is underway to develop solutions to current general aviation problems that can be implemented in the near term.

Another program will address longer term initiatives involving advanced cockpit technologies. This program has been coordinated with the goals of the FAA General Aviation Action Plan, the FAA-Industry General Aviation Coalition, and the FAA-NASA Advanced General Aviation Transport Experiments (AGATE) program.

Shift Work and Fatigue. The Civil Aeromedical Institute (CAMI) is currently conducting a joint laboratory/field research program to quantify the effects of various work schedules on the Air Traffic Control Specialist's (ATCSs) level of alertness, fatigue and readiness-to-perform. ATCSs work unique, counterclockwise, rapidly-rotating shift schedules.

Three major studies conducted to date have produced research data on the effects of various shift schedules on ATCSs performance, sleep, and health. These findings provide an empirical basis for developing measures to counter the performance effects of shift-lag and fatigue. Countermeasures can be designed to improve ATCS night shift alertness, as well as adaptation to shift work and long term health concerns. During the year, a brochure was developed on strategies for coping with shift work. A workshop was provided for ATCSs at one Air Route Traffic Control Center on the application of such strategies.

Since the results of this research are applicable to both civilian and military work forces, this research effort has been coordinated with the U. S. Army Aeromedical Research Laboratory at Ft. Rucker, and with the U. S. Air Force Armstrong Research Laboratory, Brooks Air Force Base, Texas.

Situational Assessment Through Recreation of Incidents (SATORI). Developed by the Civil Aeromedical Institute (CAMI), this new capability uses radar and voice data recorded at en route air traffic control facilities to graphically re-create operational errors and other events. Initial testing of this valuable tool for assessing the dynamics of air traffic situations was completed at the Atlanta Air Route Traffic Control Center. A corresponding system is under development for the terminal air traffic control environment.

Single Engine Instrument Flight Rules (SEIFR) in Instrument Meteorological Conditions (IMC). This study identified issues that should be addressed in considering proposed changes to Part 135. The study focused on advances in engine technology and resulting increases in aircraft reliability. More importantly, the analyses confirmed that human factors issues, in both the pilot and maintenance areas, were far more critical to accident prevention than equipment reliability issues.

The results of the SEIFR in the IMC study have broad implications, as an Aviation Rulemaking Advisory Committee group is now studying the impact of the study's findings and trying to reconcile diverse interests in modifying the prohibition on single engine passenger-carrying operations in IMC.

Research With Data Base Resources

National Aviation Safety Data Analysis Center (NASDAC). A state-of-the-art facility designed to greatly improve the way the agency develops safety information and conducts in-depth safety analyses was dedicated in July 1994. The center provides rapid on-line

access to over 4,000 data elements from the National Transportation Safety Board's accident database, the National Airspace Incident Monitoring System, facility and activity databases, and other information systems. It also features over 700 volumes of safety reference materials including the Airman's Information Manual and compilations of international statistics and reports of foreign accidents.

Prevention of Catastrophic Failure. Research is underway to minimize the risk of catastrophic failure through control of the aircraft. Analyses of existing data bases will examine a broad range of electrical and mechanical failures, flying conditions, flaws in the design and manufacturing of aircraft, and other factors contributing to accidents and incidents which have been investigated, both in this country and overseas. The program will identify risk-avoidance strategies and define research issues relevant to the certification of future aviation technologies.

System Indicators Program. The System Indicators Program, begun in 1993, provides a comprehensive overview of the national aviation system and its operational environment. The aviation system indicators show the current status and trends in accident rates, incident rates, measures of efficiency, compliance, and inspector activity among other variables. The aviation environmental indicators provide broadly based, future-oriented information useful in anticipating the potential demands on the system. One edition of the "Aviation System Indicators" report was issued during FY 1994. Quarterly bulletin board updates are planned in FY 1995.

Accident/Incident Data Matrices. This program has been developed to better characterize accident and incident data, to pinpoint gaps in the availability of information, and to analyze with greater precision the effectiveness of safety regulations, programs, and initiatives.

Aviation Safety Reporting Program. During 1994, the FAA renewed the Memorandum of Agreement with NASA for the Aviation Safety Reporting System (ASRS) which collects, processes, and analyzes voluntarily submitted aviation safety reports. These data support a wide variety of aviation safety studies by government, industry, and individual researchers. In addition, ASRS has developed a new CD-ROM platform to improve the accessibility and use of ASRS data and reports by FAA program offices, NTSB, other governmental organizations, and the aviation community. Since its inception in FY 1976, ASRS has collected and processed over 265,000 safety reports.

The National Academy of Public Administration (NAPA) has recently completed an independent evaluation of ASRS, and has concluded that the program has contributed significantly to aviation safety and to human factors research and engineering.

Automated Program Tracking. Under the leadership of Southern Region Flight Standards Division staff members, the Georgia Institute of Technology completed a study of the Flight Standards Automated System's (FSAS) Program Tracking and Reporting Subsystem (PTRS) data base which resulted in improvements to the national system. These changes will enable the Flight Standards users, worldwide, to analyze safety related data on a more timely basis and to derive aviation trends and/or patterns that could lead to the immediate modifications of previously planned inspector work program surveillance activities.

Airworthiness of Aircraft Using Advanced Digital Systems. The FAA has continued to study the airworthiness issues raised by the advanced software-based digital flight controls and avionics systems which define the leading edge of aviation design. The agency has focused its efforts on the collection of updated flight test data and analysis of computer-based, fly-by-wire automated flight control systems and equipment.

The research is especially crucial in cases where this technology is applied to flight critical applications, such as fly-by-wire, fly-by-light, and power-by-wire. In coordination with NASA, the agency is conducting research in the design, development and validation of fault tolerant software and hardware.

Driving While Intoxicated (DWI) Convictions as an Indicator of Aircraft Accidents. The consolidated aircraft accident data base was used to evaluate the effectiveness of pilot DWI records in preventing aviation accidents. The medical accident investigation team has been assisting aviation accident investigators in determining the role of drugs, alcohol, medical conditions, and human performance in the occurrence of aviation accidents.

SAFETY THROUGH IMPROVED AIRPORT TECHNOLOGY

Runway Incursions and Incident Prevention. Runway incursions continue their downward trend for FY 1994, with a rate of 0.313 per 100,000 operations, as compared with 0.328 events per 100,000 in FY 1993. Many airports completed the installation of new guidance signs and all airports serving air carriers will have new signs in place by January 1996. Improved signs, marking, and lighting all contributed significantly to the decline in runway incursions from the high of 281 events in 1991, to 189 in calendar year 1993 -- a 34.5 percent reduction.

Most runway incursions occur in daylight and in good weather. But since surface accidents have occurred in reduced visibility and at night, the FAA introduced special low-visibility surface movement planning requirements allowing operations in visibility as low as 300 feet. In 1994, the FAA completed training for regional and airport personnel for operating in conditions of low visibility. The Seattle-Tacoma International Airport, a demonstration airport under the Runway Incursion Program, was the first airport to have its plan approved. Last winter, approximately 45 operations were conducted in visibility as low as 300 feet. Special surface movement procedures increased the capacity of the airport under these conditions, while maintaining a high level of safety.

In November 1993, the FAA issued The Future Airport Surface Movement Safety, Guidance, and Control System: A Vision for Transition into the 21st Century. This document describes operational concepts, requirements and timing for improving both safety and efficiency of surface operations at our nation's airports.

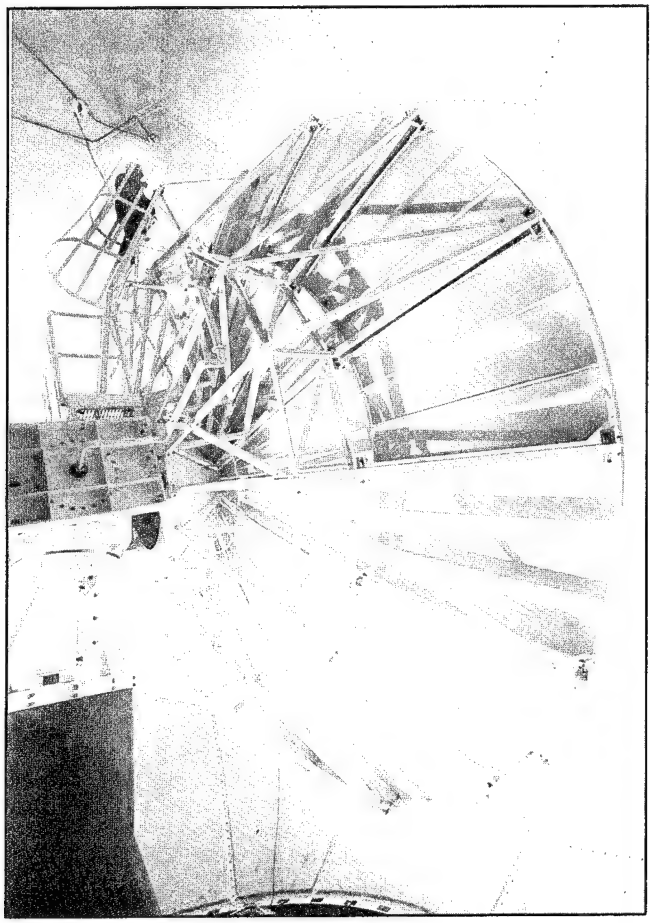
Airport Visual Guidance. An essential part of aircraft movement on airport surfaces is proper guidance during taxiing. A draft specification was developed and evaluated for a standard stop bar lighting system intended to prevent an aircraft from entering the runway area without proper approval. This system will improve low visibility aircraft operations below 600 feet Runway Visual Range (RVR). The system was tested at Seattle Tacoma International Airport.

Airport Surface Traffic Automation (ASTA). This highly sophisticated surface safety system will link ground sensor primary radar, the Automated Radar Terminal System (ARTS), Airport Surface Detection Equipment (ASDE), the Airport Movement Area Safety System (AMASS), and differential GPS to provide positive identification of aircraft, reduce taxi delays and increase airport surface capacity and safety. Thirty-seven of the ASTA systems will be installed at major airports which have two of the components: ASDE-3 and AMASS.

LaGuardia Airport Runway Safety Area. A top safety and capacity project, the construction of a safety area at the end of Runway 31 will also allow for the relocation of Instrument Landing System localizer on Runway 13 from its current offset position to the runway centerline. This relocation will permit coupled approaches and a reduction of missed approaches. Construction began on July 1, 1994. The basic safety area is expected to be in place by December

1994, with all construction completed by early 1996.

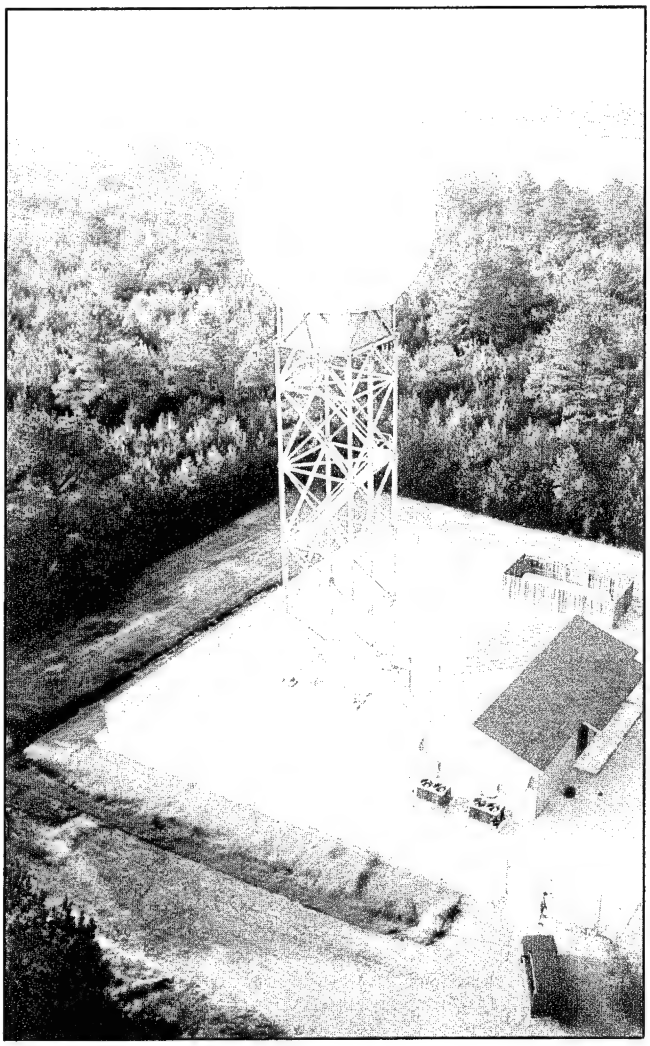
Terminal Doppler Weather Radar (TDWR). The primary purpose of TDWR is to detect and report hazardous wind shear. A secondary purpose is to improve the management of air traffic in the terminal area through TDWR-derived forecasts of gust-front-induced wind shifts and precipitation. The first TDWR site was commissioned in July 1994 at Houston (IAH) Intercontinential Airport. A total of 47 TDWR Systems are being procured. Deployment of all 47 systems will be completed by the end of 1996.



Inside Doppler Radar dome

LLWAS-Network Expansion (LLWAS-NE). This upgraded system provides improved microburst detection and identification, new displays for controllers, runway oriented wind shear information and Terminal Doppler Weather Radar (TDWR) integration. Following operational test and evaluation at Orlando International Airport in FY 1994, the software is being updated by the contractor. Installation is planned at nine airports. The New Denver International Airport LLWAS-NE has been approved for commissioning. In addition, an LLWAS-NE will be installed at Dallas/Ft Worth in early 1995 as a test and operational system. The remaining LLWAS-NEs will be commissioned in 1996.

Runway Surface Technology. The FAA published a technical report on the feasibility of



The nation's first terminal Doppler weather radar has been installed at Houston, TX

soft ground arresting systems, including full scale tests of the safe arrest of a Boeing 727 aircraft traveling at 50 and 60 knots. The report also detailed successful results of overrun and undershoots scenarios performed on the FAA Boeing 727 flight simulator. A test arrestor bed comprised of light weight, low density concrete was installed at the FAA Technical Center. Results from this test project will promote the installation of an operational prototype soft ground arrestor at John F. Kennedy International Airport in 1995. Other studies and tests include:

- The FAA and the Corps of Engineers completed testing of optimal sand application rates which might improve runway traction under winter conditions.
- This year, the Office of Airports established an Aviation Rulemaking Advisory Committee to develop regulations dealing with the measurement of friction on runways and the installation of new distance-to-go signing.

Airfield Markings. The FAA has completed an evaluation of new pavement marking materials which have higher conspicuity and durability than the presently used materials. As part of the study, the effectiveness of beaded materials was also evaluated. Results showed that the new materials, which contained sand and bead additives, were an improvement and would increase the safety of operations.

Airport Safety Data (5010) Program Study. This study concluded that the 5010 program is a basic information system for many public and private sector agencies responsible for aviation safety. The study presented a plan for streamlining the program, achieving greater automation, improving inspector training, and reevaluating the schedule of inspections.

SAFETY THROUGH EDUCATION, TRAINING AND OUTREACH

Aviation Safety Hotline. The FAA safety hotline provides a confidential medium where aviation workers and the general public can report safety issues and concerns. Since its establishment in 1985, calls to the hotline have nearly doubled. In FY 1994, 1,601 calls were received at the nationwide toll-free number: 800-255-1111.

Passenger Education. During FY 1994 a passenger education public service announcement (PSA) and a complementary brochure was developed. The 30-second PSA encourages airline passengers to fasten their seat belts, wear sensible clothing, listen to the safety briefing and obey carry-on luggage restrictions. The full-color brochure expands on each of these subjects and also contains a passenger safety checklist.

General Aviation. A second set of the popular Trigger Tapes was produced for use by general aviation pilots. The Trigger Tapes consist of six scenarios depicting various realistic situations, each about 5 minutes in length. Follow-up group discussions analyze the pilot behavior which led to each situation and explore how such errors can be avoided. The videotape and discussion guide covers the following topics: runway incursions, fuel management, icing, navigation complacency, and wind shear.

Oshkosh '94. For the annual EAA Convention and Fly-In, Oshkosh, Wisconsin, a 14 minute videotape was produced explaining the approach and landing procedures for the various classes of aircraft expected to fly to the event. This videotape, based on the 1994 Fly-In NOTAM was distributed to the 700 EAA Chapters throughout the United States and to FAA Aviation Safety Program Managers. In addition, a card was distributed which listed all the radio frequencies in the greater Oshkosh area.

New Airspace Classification. The new airspace classification system began to be phased in on September 16, 1993. Cards and brochures explaining these changes were distributed throughout 1994 at exhibits, conventions, and to organizations and individuals who requested copies.

New Weather Reporting System (METAR/TAF). In anticipation of the January 1996 transition to this new weather reporting system, "An Introduction to METAR/TAF" was produced. The 10-minute videotape explains in simple language how the new Aviation Routine Weather Report (METAR) and International Aerodrome Forecast (TAF) system works.

Controlling Exposure to Biological Hazards. To protect the health and safety of aviation safety inspectors, Flight Standards conducted a nationwide training program covering the medical risks of blood borne pathogens and preventive methods for avoiding exposure. The training reached more than 2,700 inspectors and other personnel who may engage in accident investigation. The Civil Aeromedical Institute also produced two videos on blood borne pathogens for use in similar training.

Aviation Medical Examiners (AMEs). Nineteen seminars were conducted at the Civil Aeromedical Institute (CAMI) and at other sites across the country to provide training for the 5,742 AMEs certified by the FAA's Office of Aviation Medicine, 378 of whom were newly designated during the past year. Standards and procedures for certifying AMEs are topics dealt with in a new computer-based tutorial designed to train AME office staff.

Aviation Medicine Educational Outreach. CAMI distributed 78,095 Aviation Safety Brochures (Pilot Vision, Hypoxia, Seat Belts and Shoulder Harnesses, Spatial Disorientation, and Over the Counter Medications and Flying) to the Civil Aviation Community. Four Federal Air Surgeon's Medical Bulletins and 21 AAM Research Technical Reports were published and made available to the civil aviation community and others interested in promoting aviation safety through aviation medicine knowledge.

Airman Education Programs. Sixty-one physiological training courses were conducted at CAMI to provide the mandatory training requirements of FAA flight personnel (88 participants) and to promote aeromedical safety among the civil aviation pilot population (940 participants). In addition, 1,259 civil aviation pilots received physiological training at military facilities through an FAA/USAF Agreement. Global survival training courses were conducted at CAMI for 75 participants.

CAMI also provided 490 spatial disorientation demonstrations (vertigon rides) to FAA flight personnel and civil aviation pilots. An additional 1,397 spatial disorientation demonstrations were provided to civil aviation pilots participating in the National Accident Prevention Program.

CAMI acquired a new General Aviation Spatial Disorientation Demonstrator with 3 degrees of freedom (yaw, pitch, and roll) which is the first of its kind in the world. This unique device provides civil aviation pilots with the opportunity to experience a highly convincing demonstration of the difficulty in maintaining spatial orientation during IFR conditions, and to learn the importance of relying on cockpit instrumentation to safely fly under these conditions.

CAMI completed development of a new Crew Resource Management (CRM) Training Course for AVN flight personnel.

Air Ambulance Safety. Two meetings were held on air ambulance operations. One meeting focused on fixed wing aircraft and the other on rotary wing aircraft. The meetings featured discussions of safety challenges unique to air ambulance operations, including radio interference between medical and air navigation electronic equipment, crashworthiness considerations, and altitude-related problems with the operation of medical equipment.

Publications. A number of pamphlets and brochures on safety themes were published during the year. Among them:

- "Chartering an Aircraft, A Consumer Guide", assists the air traveler in choosing an aircraft charter operator. The guide provides information on selecting safe, suitable, FAA certified air taxi operators.

- "Summer Weather Information for Pilots/Winter Weather Information for Pilots. Two brochures explain the unique features of flying in the different seasons. These four page pamphlets also show the weather symbols.
- "A Guide for FAA Employees - Airport Ground Vehicle Operations". This booklet explains how to safely drive on airports. It covers such topics as signs and markings, communications procedures and other basic information needed to safely navigate on the ground. This brochure supplements FAA Order 5200.7 Training for Drivers on Airport Operations Areas.
- "GA Preflight Planning Study". This report itemizes information general aviation pilots need for a safe flight. This is a continuation of ASF's work on the Pilot Information Center.

SYSTEM CAPACITY

Build system capacity that will minimize delays and allow fair access for all types of aviation.

ENLARGING AIRPORT CAPACITY

Capacity Council. Increasingly, as the Nation's air travel industry resumes steady growth, airports themselves are likely to cause aviation bottlenecks. Thus, in FY 1994, the FAA Administrator established the FAA's Capacity Council, co-chaired by the Assistant Administrator for Airports and the Executive Director for System Operations. Their charter is to ensure a comprehensive approach to airport capacity initiatives in general and, more specifically, that airfield expansion projects are fully coordinated with installation of associated instrumentation so that full capacity benefits are immediately available to airport users.

New Austin Airport. The city of Austin is developing a replacement airport at the former Bergstrom Air Force Base to serve passenger carriers, general aviation, and cargo planes. Scheduled to open in 1997, the new airport will have two parallel runways providing simultaneous instrument approach capability, a new passenger terminal, and cargo area. The FAA completed the Environmental Impact Statement and issued the Record of Decision in March 1994. In FY 1994, FAA committed $90.9 million Airport Improvement Program (AIP) funds over the next 8 years through a Letter of Intent and issued two grants for $18.8 million.

New Northwest Arkansas Regional Airport. The Northwest Arkansas Regional Airport Authority is pursuing the development of a new commercial service airport to replace the existing Drake Field. The new airport will have a single 8,800 foot runway with precision approach capability and is scheduled to open in late 1997. The FAA completed the Environmental Impact Statement and issued the Record of Decision in August 1994. In FY 1994, FAA issued a $9 million AIP grant for land acquisition.

Ankeny, Iowa. A reliever airport, Ankeny Regional Airport, located just north of Des Moines, Iowa, opened in February 1994. Approximately $7.1 million in AIP funds was granted to the airport for land acquisition, site preparation, paving, airfield equipment, and fencing.

Three New General Aviation Airports. New general aviation airports opened in Nebraska City, NB, and in Rio Vista and Byron, CA.

Military Airports Program. The FAA is pursuing a series of initiatives with the Department of Defense (DOD), states, and local governments for joint civilian and military use of existing military airfields and the conversion of former military facilities to civilian use. Currently, 38 major military airfields are available for use as civil airports as a result of base closures in 1988, 1991, and 1993. Additional airfields are scheduled for closure by

DOD in 1995. These military airfields represent a Federal investment of about $38 billion in airfield and associated infrastructure. Comparatively little investment will be required to convert many of these airfields to major civil airports. Large parcels of military property adjacent to several existing civil airports are also available for expansion projects.

Airport master planning grants have been issued to 24 potential civil sponsors and 12 long term leases have been issued by the Department of Defense. It is anticipated that 31 of the 38 military airfields will be converted to civil airports. Roughly one-third of the airfields have the potential to become commercial service airports; one-third have the potential to become reliever airports; and some of the remaining airports could become general aviation airports.

Ten transitioning airports received over $90.0 million for capital improvements under the AIP. A number of these converted airfields are strategically located in major metropolitan areas and have the potential to add significant new airport capacity to the national airport system.

New Runways at Four Major Airports. AIP capacity enhancement funding helped finance projects for new runways at Dallas-Fort Worth, Salt Lake City, Philadelphia, and Phoenix.

Fifth Runway Planned at Atlanta Hartsfield International. An environmental assessment completed in February 1994 resulted in a Finding of No Significant Impact (FONSI) for a fifth commuter runway at the Hartsfield-Atlanta International Airport, clearing the way for the project to move forward. If all goes according to schedule, the new runway will open in mid-1999. Alternatives are also being studied for the best taxiway system to serve the proposed runway.

Airport Capacity Design Program. This program identifies and assesses various corrective actions which, if implemented, will increase the capacity, improve operational efficiency and reduce delay at the airports under study. At the end of FY 1994, 37 of the top 50 airports nationwide have been studied and cost delay savings improvements recommended. Four of the 37 studies were completed during FY 1994. The studies include Ft. Lauderdale, Minneapolis/St. Paul, Eastern Virginia and Cleveland.

Airport and Airspace Capacity Tactical FY 1994 Initiatives. An Airport Capacity Enhancement Terminal Airspace Study for San Bernadino, CA, evaluated the capability of commercial operations at the former Norton Air Force Base. An evaluation was also made of the potential use of Boeing 777 folding wing aircraft at New York LaGuardia. A final report is due in the first quarter of FY 1995.

Landside Capacity. The FAA and the Federal Highway Administration investigated use of intelligent vehicles within a multimodal strategy to enhance landside capacity at airports.

High Speed Taxiway Turnoff. The FAA began pilot acceptance testing on optimal locations and geometry of high speed taxiway turnoffs. Testing was performed on an FAA Boeing 727 flight simulator with the goal of increasing airport capacity by minimizing runway occupancy time.

INTRODUCING NEW AIR TRAFFIC CONTROL TECHNOLOGY

Advanced Automation System. One of the FAA's primary achievements of FY 1994 was to restructure the Advanced Automation System program to bring it back on line in terms of cost, timing, and achievement. Portions of the program were canceled or modified. A new management team is in place and the program is progressing on a solid, business-like footing. For additional information about the AAS program, see page 69.

Southern California Metroplex. Consolidation of five TRACON locations in Southern California

into one facility was completed during July 1993. The new facility in San Diego, California, provides radar air traffic control service to aircraft from the San Fernando Valley area, north of Los Angeles, to the Mexican Border. The consolidated TRACON is a first step in the process to manage the growth of air traffic in Southern California more effectively. The 115,000 square foot facility also includes a separate 7,000 square foot child care center. The facility opened with the Los Angeles TRACON in February 1994, followed by the transition of operations at Coast (El Toro) TRACON in May and Burbank TRACON in October. Transition of the final two facilities in April and September 1995 will complete the consolidation.

Southern California TRACON

New Potomac Metroplex. The Potomac Metroplex Program was established in October 1993 to consolidate the approach controls at Washington, Dulles, Baltimore, and Andrews Air Force Base into a single Metroplex Control Facility (MCF) serving the Washington metropolitan area. The consolidation will reduce delays, enhance safety, and allow controllers to better handle the increase in air traffic projected within the next decade.

During the past year, teams were established to manage the extensive planning, engineering, procurement, integration, and transition activities required to accomplish a project of this magnitude. The $145 million dollar facility will house about 400 FAA employees, including about 250 air traffic controllers.

Dallas/Fort Worth Metroplex. On July 15, 1994, the FAA formally dedicated two new airport traffic control towers to serve the nation's second busiest airport. The Cowboy Doppler Very High Frequency Omnidirectional Radio Range with Tactical Air Navigation facility was also commissioned to make optimum use of the airport's air traffic system.

Construction of a new east runway began in late 1993. A second new runway will be constructed on the west side of the airport.

DFW International Airport is the first airport in the world to receive approval to conduct triple and quadruple parallel simultaneous instrument landing system (ILS) approach procedures.

Assisting Deputy Administrator Linda Hall Daschle in the ribbon cutting ceremonies are (l-r) Jeff Fegan, Executive Director, DFW International Airport; Representative Joe Barton; David Braden, Chairman DFW Airport Board; Clyde Dehart, Southwest Regional Administrator , and Representative Pete Green

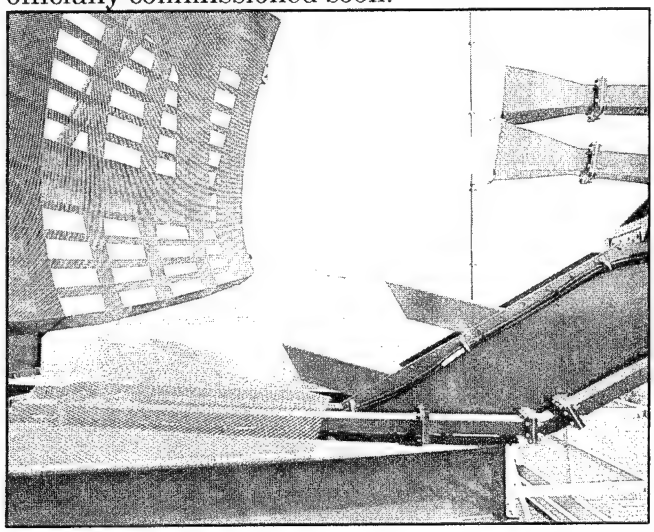
Voice Switching and Control System (VSCS). Air Traffic's communication replacement project is progressing on schedule. VSCS is an automated communication system that provides flexible digital air-to-ground and ground-to-ground voice communications links between controllers and en route aircraft. The system it is replacing is over 30 years old. Site surveys have been completed at 13 of the 23 operational sites.

The first VSCS was delivered to the Seattle Air Route Traffic Control Center (ARTCC) on June 29, and recently completed full installation

and testing. Hardware installation is underway at Salt Lake, Denver, and Atlanta ARTCCs. Testing of the operational software began at the FAA Technical Center in November 1994.

Airport Surveillance Radar Windshear Processor. The Albuquerque Air Traffic Control Tower, assisted by MIT-Lincoln Laboratories, tested the Airport Surveillance Radar (ASR-9) windshear processor. The windshear processor is an addition to the ASR-9 that provides microburst detection.

Terminal Radar Data Use in En Route Environment. The first use of terminal radar in an en route environment is being tested at the Fort Worth Air Route Traffic Control Center (ARTCC). A CV-4400 data converter installed at the Lubbock, Texas, Air Route Surveillance Radar (ASR-9) formats the terminal radar data to make it compatible with ARTCC long range radar input. The terminal data provides additional low altitude coverage for controllers in the ARTCC. The system has been installed, flight checked to verify coverage, and the new primary and secondary radar services are expected to be officially commissioned soon.



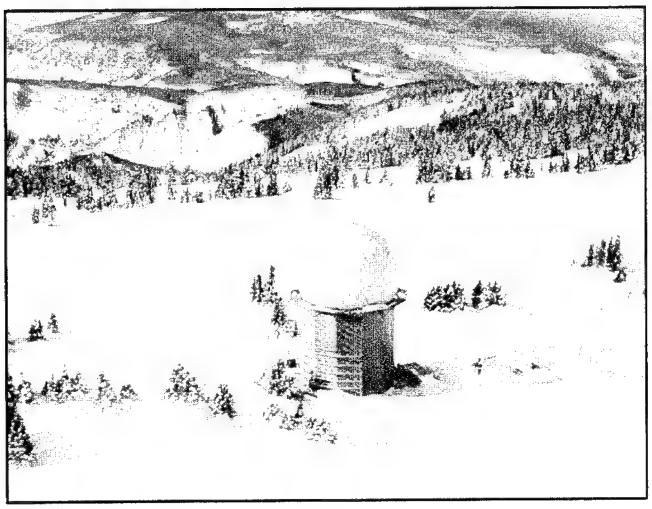
ASR-9 has been installed at 9 locations.

Automated Weather Observing System (AWOS) and Automated Surface Observing System (ASOS). Eight additional AWOSs were commissioned in FY 1994, bringing the total number to 181. Nineteen sites, mostly in Alaska, remain to be installed. Eighty sites received ASOS in FY 1994. Of 537 FAA-sponsored ASOS sites, 312 have now been installed. Over 900 videos and 20,000 information cards have been distributed to promote user education of the two systems.

Flight Service Station (FSS) Modernization. Now in the final phase of completion, this major initiative consolidates 318 previously existing FSS facilities into 61 automated flight service stations (AFSS). The new automated service provides improved access to weather and other information critical to pilots, simplifies flight plan filing, and provides a flight service automation system that can handle projected increases in demand for flight services economically and efficiently.

Thus far, there are 59 commissioned AFSSs. All are operational except the St. Louis AFSS, which was damaged by the Midwest Floods of 1993. The two remaining AFSSs are awaiting deployment of required equipment. To date, 258 FSS consolidations have been completed, with 12 of those consolidations occurring during FY 1994. The remaining 60 FSSs are allocated into one of three categories: AFSS transition (2); auxiliary FSS (31); or consolidation (27). The remaining consolidations are scheduled to take place in FY 1995. The auxiliary FSS implementation date has not been determined.

Red Table Mountain Radar Commissioned. This mountain top radar located near Aspen and Eagle, Colorado will improve capacity at mountain airports serving an ever-growing number of heavy jet operations. Many of the major airlines are providing frequent, scheduled flights into airports near major ski resorts, such as Vail and Aspen, and the new radar facility dramatically lowers the radar coverage floor. At nearly 12,000 feet elevation, this facility is the highest radar site in the United States. The construction season at Red Table Mountain was limited to four months each year.



Red Table Mountain Radar.

Newark International Airport, Runway 11 Instrument Landing System. A contract was awarded in September 1994 to install an Instrument Landing System (ILS) for Runway 11 at Newark International Airport (EWR) to off-load small aircraft from the major runways. This ILS has long been sought by the airlines and has become the focus of Congressional attention. While environmental issues concerning soil contaminants still must be resolved, the FAA's Eastern Region is working toward a planned commissioning date of June 1995.

Denver International Airport. The FAA completed the installation of over 150 state-of-the-art facilities at DIA to allow the airport to operate at peak efficiency and capacity. Initial capability will consist of triple simultaneous, instrument approaches and very low visibility operations. The new airport required the re-engineering of nearly 200,000 miles of airspace for en route, transition, and terminal operations. Funding from the Airport Improvement Program and Passenger Facility Charges supplemented revenue bonds as funding sources.

Precision Runway Monitor Program (PRM). PRM is a high update rate radar with computer predictive displays which allow controllers to monitor aircraft on simultaneous independent IFR approaches to parallel runways space less than 4300 feet apart. This capability allows certain airports to increase capacity, reduce delays, and save fuel during periods of poor visibility. The first preproduction system at Raleigh-Durham airport completed its first year of operation, and the five production systems have completed factory test.

The first production system was installed in Minneapolis in November 1994 and will be operational by October 1995. Options for installation of PRM at Atlanta and Raleigh Durham (replacement) will be awarded by January 1995. Other airports under consideration to receive PRM include JFK, PHL, BWI and PDX. Further research is underway to reduce the parallel runway separation standard to 3000 feet and possibly to 2500 feet with the use of a PRM.

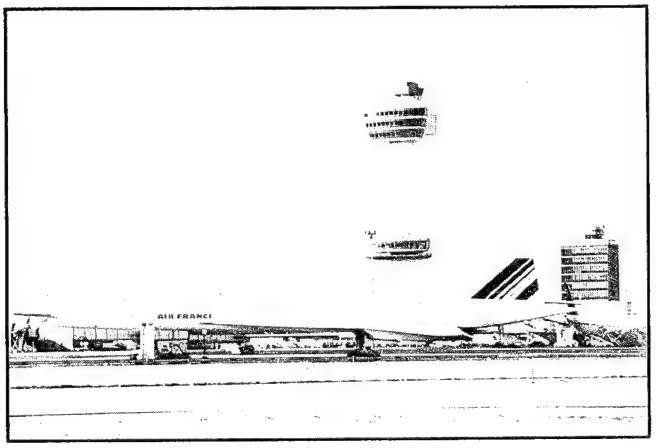
FAA Facilities' Modernization. The majority of the buildings housing the FAA's air traffic control functions are over 30 years old. Many require refurbishing, upgrading, or replacement in order to maintain service, improve effectiveness, and reduce costs. New towers are also required to support growth. Each year, depending on funding availability, the FAA replaces 5 to 7 Airport Traffic Control Towers (ATCT) and one or two Terminal Radar Approach Control (TRACON) facilities. In addition, approximately 20 facilities receive some level of major modernization and over 100 facilities need minor modernization. Over the next five years Air Route Traffic Control Centers (ARTCC) must be modernized and expanded to meet changing energy, safety, and security needs, and to house new equipment. The following examples are representative of work performed in FY 1994:

1) JFK International Airport. On October 31, 1994, JFK Airport Traffic Control was relocated from the existing 170-foot tower to a new 321-foot tower. In addition to improved line-of-sight, the new tower provides space for new equipment installations, more controller workstations, and much needed administrative space in the base building.

NEW EQUIPMENT COMMISSIONED
From Oct. 1, 1993, Thru Sept. 30, 1994

Facility Type	Equipment Commissioned FY-93	FY-94
Air Route Surveillance Radar - FAA and Military (ARSR)		1
Automated Radar Terminal System (ARTS)	1	5
Airport Surface Detection Equipment (ASDE)	1	1
Automated Surface Observing System (ASOS)	0	2
Airport Surveillance Radar-FAA and Military (ASR)	9	9
Airport Traffic Control Tower (ATCT)	7	8
Airport Weather and Information System (AWIS)	3	
Automated Weather Observing System (AWOS)	20	9
Bright Radar indicator Terminal Equipment (BRITE)	15	22
Distance Measuring Equipment (DME)	17	17
Data Multiplexer (DMUX)	17	39
Flight Data Input/Output Remote (FDIOR)	10	20
Flight Service Data Processing System (FSDPS)	4	4
High Capacity Voice Recorders	1	9
Integrated Communications Switching System (ICSS)	20	25
Instrument Landing System (ILS	16	22
Low Level Wind Shear Alert System (LLWAS)		2
Long-Range Navigation C Monitor (LRANCM)	3	4
Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR	24	24
MODE-S	8	22
Maintenance Processing System (MPS)	7	9
Non-directional Beacon (NDB)	20	11
Precision Approach Path Indicator (PAPI)	59	44
Remote Center Air/Ground Communications Facility (RCAG)	1	9
Radio Communications Link Repeater (RCLR)	124	4
Radio Communications Link Terminal (RCLT	17	24
Rapid Deployment Voice Switch	0	13
Remote Communications Outlet (RCO)	4	8
Runway End Identification Lights (REIL)	28	15
Radar Microwave Link Repeater (RMLR)	2	
Remote Readout Hygrothermometers (RRH	4	2
Remote Transmitter/Receiver (RTR)	31	38
Runway Visual Range (RVR)	2	0
Small Tower Voice Switch	0	36
Television Microwave Link Transmitter (TMLT)	3	4
Terminal Radar Approach Control (TRACON)	1	1
Visual Approach Slope Indicator (VASI)	7	1
VHF Omnidirectional Range (VOR)	8	2
VHF Omnidirectional Range Test (VOT)	9	5
Voice Switching and Control System (VSCS)		0
Total	503	471

* Information based on Facilities Service Equipmemt Profile and AND program manager review as of 10/5/94



New JFK ATC Tower dedicated January 25, 1995

2) Los Angeles International Airport. The new air traffic control tower is 65 percent complete and scheduled for commissioning in March 1996. The 252-foot structure will have 30,000 square feet of administrative space in the base building. The 850 square foot tower cab can accommodate 18 controller positions. The present tower was commissioned March 25, 1959.

New Los Angeles ATC Tower.

3) Albuquerque Airport Traffic Control Tower/Terminal Radar Approach Control Facility. The new control facility to replace the 40-year old military ATCT/TRACON facility located on Kirtland Air Force Base was commissioned July 1, 1994.

4) Minneapolis-St. Paul. On August 30, 1994, a contract was awarded to construct a new Air Traffic Control Tower (ATCT) at Minneapolis-St. Paul International Airport. The new tower will be attached to the existing structure, which houses the Terminal Radar Approach Control (TRACON). A new base building is also being constructed to allow for additional administrative needs. Construction is underway, with a scheduled completion date of September 1997.

5) Chicago Midway and Pontiac, MI. Construction contracts were awarded in FY 1994 for $4.8M and $5M, respectively. Both structures are being replaced to meet increased operations and are scheduled for commissioning in November, 1996.

6) Anchorage, Alaska. A major expansion and of the Anchorage ARTCC is underway. Progress in FY 1994 included completion a 50,000 square foot Technical/Operations addition, a 10,000 square foot expansion of the utility services support building, and installation of the new ARTCC Critical and Emergency Power System (ACEPS). The transition includes the installation of the new equipment and the relocation of equipment from the existing facilities. This transition program will carry well beyond the year 2000.

7) High Desert TRACON. The FAA and DOD celebrated the commissioning of the new state-of-the-art automation system at High Desert TRACON on February 22, 1994. System reliability is exceptionally high and user acceptance even higher. The baseline software is currently in use at one FAA ATCT facility and two DOD Military Radar Units. The combined FAA/DOD/Contractor team is testing a software enhancement for Air Route

Traffic Control Center data interface capability, and is developing a safety software upgrade to reduce controller workload through improved conflict projection and detection.

Alaskan NAS Interfacility Communications System (ANICS). This project establishes an FAA-owned and/or leased private line network employing satellite earth station technology to support the full modernization of the NAS throughout the Alaskan Region. ANICS is the first major acquisition conducted by a region and the first satellite communications network in the FAA. The system will provide voice, control, and data telecommunications for air traffic control, navigation, flight service and weather observation, and associated functions.

Each remote site requires a capital investment of about $1 million. This investment, however, reduces telecommunications costs by as much as $200,000 per year, per site. Consequently, agencies such as the U.S. Air Force, U.S. Coast Guard, Department of Interior, National Weather Service, and the Alaska Fire Service are interested in obtaining circuits on this system for their own aviation related requirements.

In all, nineteen sites started construction in FY 1994, including four hubs located at Anchorage ARTCC, Kenai AFSS, Juneau AFSS and Fairbanks AFSS. Kenai AFSS and Anchorage ARTCC began operation in November 1994. Fifteen sites are expected to be operating by January 1995. Installations are planned at about 20 sites per year during FY 1995 and FY 1996.

Remote Maintenance Monitoring System (RMMS). On September 9, 1994, the FAA awarded a contract to CGH Technologies, Inc., to establish a data base of FAA facilities and services. The study will evaluate and assess the feasibility of applying OATS platforms and networks to access the current and planned capabilities of the RMMS. The study will also assess equipment performance and status parameters resident at remote and terminal NAS facilities. CGH will evaluate alternatives for planning, transitioning, and operating in an automated remote maintenance monitoring environment.

Leased Interfacility NAS Communications System (LINCS). In 1994, the LINCS infrastructure was completed and nearly 5,000 of the total 14,000 circuits have been ordered. Existing telecommunications channels have been transitioned to the LINCS network as the new circuits become available. The cutover of circuits to the LINCS network continues, with full implementation expected by early 1996.

Telecommunication Management and Operations Contract Award. A contract was awarded to RMS Technologies, Inc., Marlton, NJ, to support a wide range of activities necessary to plan and manage FAA telecommunications.

FAA Headquarters' Contracting Activities. During FY 1994, FAA Headquarters awarded almost $2.2 billion in funded contracts, covering Operations, Facilities and Equipment, and Research and Development. Nearly 5,000 procurement requests were processed, and 4,049 separate contracts were awarded. Included in the $2.2 billion total were contracts for the modernization of the National Airspace System and other major acquisitions adding up to $1,663,168,000 for the year. The agency exceeded its goals for contracts to minority businesses and other special emphasis entities.

INCREASING CAPACITY OF THE NATION'S AIRSPACE

New Air Traffic Command Center. In March 1994, the Air Traffic Control System Command Center was relocated from FAA Headquarters in downtown Washington, DC, to larger quarters in a new, state-of-the art building in Herndon, VA, near Dulles International Airport. The flow control center is rapidly becoming a hub for global air traffic management and is a major step in boosting aviation safety, capacity, and efficiency. The National

Maintenance Control Center, which provides information on the daily status of the NAS, was relocated concurrent with the opening of the new facility.

The new facility also houses the Air Traffic Services Cell which is composed of DOD and FAA personnel. This unit was established in 1992 to coordinate military and civilian air traffic during times of international tension, war, and domestic emergencies. It was staffed in 1994 to support Operation Uphold Democracy in Haiti.

Approach Procedures. The use of today's technology and advanced systems (see PRM) can result in procedural improvements which enhance both terminal and en route airspace capacity while maintaining the current high-level of safety. Improved procedures have been established for simultaneous approach, dependent parallel approach, dependent converging instrument approach, and other innovative applications of emerging and existing technologies. These initiatives translates directly into increased operating efficiency for the aviation industry. Further refinements are being studied by multi-disciplined FAA workgroups.

Operational Traffic Flow Planning (OTFP). This planning effort is directed toward achieving near-term improvements in national-level Traffic Flow Management (TFM). The program uses techniques such as operational concept evaluation, rapid prototyping, advanced operations research and computer modeling. Elements currently in operational testing are the High Altitude Route System (HARS), Planned Knowledge-Based Flow Planning (SMARTFLOW), Daily Decision Analysis System (DDAS), and Flight Schedule Monitor (FSM).

National Route Program. This program permits aircraft to fly the most cost-effective routes for certain city pairs, rather than preferred routes specified by the FAA. Response from the user community has been enthusiastic ever since the program's inception four years ago. Participation in the program has risen from 30 scheduled flights a day to more than 700. In FY 1994, the FAA expanded the program from 56 to 104 city pairs. Moreover, a new initiative was begun to simplify and restructure the program using a phased-in approach. This expansion will increase user program eligibility and flexibility, thus reducing restrictions and constraints on the system.

Departure Sequencing Engineering Development Model (DSEDM). The objectives of departure and en route flow management are safe separation, fewer delays, and minimum constraints on system users and aircraft movement. DSEDM aids Traffic Management Coordinators in managing departure traffic flow from multiple airports destined for similar fixes and routes of flight.

The model was installed in June at facilities in the Los Angeles Basin, where the terminal airspace constraints and departure fix restrictions provide an ideal scenario for testing its capabilities.

Terminal Airspace Capacity Design Teams. Terminal Airspace Capacity Design Teams were initiated in Salt Lake City to reconfigure the airspace to optimize the benefit of the new independent parallel runway, and in Tampa to evaluate the present airspace capacity and evaluate potential reconfigurations.

Dallas/Fort Worth Land and Hold Short Special Demonstration. This special demonstration, which uses intersecting runway criteria to taxiway-runway combinations, has significantly improved the efficiency of Dallas/Fort Worth International Airport operations. An interim lighting system was commissioned to enhance the identity of the hold short point. User feedback from the demonstration has been overwhelmingly positive and the procedure is now being considered for national adoption.

EXPANDING CAPACITY OVER THE OCEANS

Oceanic Traffic Planning System. This system combines automated information gathering techniques with route development and analysis tools to aid controllers in managing oceanic air traffic. The system provides flexible track generation, an aircraft situation display, and a track advisory function. In FY 1994, FAA decided that the Oceanic Traffic Planning System (OTPS) project should be integrated with the Enhanced Traffic Management System rather than operated as a stand alone system. OTPS will remain in the R&D phase until the integration is complete.

Software enhancements were developed in FY 1994 to improve the track generation and track advisory functions. A system was delivered to the FAA Technical Center for development and testing of new initiatives. Other accomplishments include a training plan for the Dynamic Ocean Track System portion of OTPS and publication of the OTPS Requirements Order. Efforts are underway to rehost DOTS onto a new hardware platform with an open operating system. The maintenance plan is in development and all existing documentation is being revised to reflect the new hardware and open architecture.

Oceanic Data Link. During the year, the agency began to develop Oceanic Data Link (ODL) and tested a prototype for use by controllers. Also tested was a related prototype, the Boeing datalink avionics package, which will be installed in aircraft. ODL, which provides ground-to-ground and air-to-ground data links between pilot and ATC systems, is an interim capability which will eventually evolve into the Advanced Oceanic Automation System which is being specifically designed for the unique requirements of trans-oceanic air traffic control.

AIDC System. Another prototype completed in FY 1994 is the Air Traffic Services Interfacility Data Communications (AIDC) system for ground-to-ground communication via data link between adjacent Flight Information Regions. Initial testing took place between air traffic control centers in New York and Piarco, Republic of Trinidad and Tobago.

A prototype AIDC will also be installed in the Petropavlovsk-Kamchatsky region and connected to the Anchorage Air Route Traffic Control Center. Currently, messages between Russian and U.S. controllers are exchanged by very slow and unreliable teletype or passed over high frequency radio voice communications. These messages are often not received or are garbled by poor translation. The AIDC is expected to significantly improve ground to ground communications and permit new routes to be safely opened over the Russian Far East.

Dynamic Aircraft Route Planning (DARP) in the South Pacific. Usually, flexible tracks are generated based on wind, weather, and special operations information several hours prior to aircraft departure. DARP provides the structure, procedures, and processes necessary for the re-routing of aircraft in midflight to take advantage of updated information as the aircraft proceeds to its destination. This capability is especially valuable to airlines flying the long South Pacific routes. A Los Angeles-Sydney track was initiated and approval received to add Auckland. Operational testing of tracks between Eastern Canada and the U.S. to the Orient was completed with positive results. In FY 1994, the FAA performed a number of studies on DARP capabilities in the South Pacific. Several airlines participated in the initial Shadow Study. The data collected was used to generate scenarios for an End-to-End System Simulation performed at the FAA Technical Center.

A schedule for implementing DARP in the South Pacific has been developed by the Informal South Pacific Air Traffic Services Coordinating Group, commencing with daily single DARP re-routes in 1995.

ADVANCING THE FRONTIERS OF TECHNOLOGY

U.S. Global Positioning System - Early Benefits. The FAA is moving quickly to make the shift to satellite-based navigation -- a move which will make possible more flexible and direct routings, and reduced separation between trans-oceanic flights. In FY 1994, GPS became operational and available to any user with a GPS receiver for supplemental navigation, increased situational awareness, and IFR non-precision approaches (Category I precision approaches when the proper ground augmention is in place). For a detailed description of the FAA's activities to make GPS available to civil aviation, see "21st Century Aviation" page 66.

Converging Runway Display Aid (CRDA). This software automation tool is designed to assist air traffic controllers in setting up and maintaining proper separation of aircraft on final approach to either converging or intersecting runways. When used in conjunction with Dependent Converging Instrument Approach (DCIA) procedures, CRDA can be used in Instrument Flight Rule conditions of low visibility. CRDA is currently operating at St. Louis-Lambert, Boston Logan, Philadelphia International, Cincinnati Covington, and Norfolk International. At St. Louis-Lambert, CRDA increased the hourly acceptance rate during IFR conditions from approximately 36 to 48. Total airport operations at Boston Logan are expected to increase from 100 or less to 110 per hour. In the near future, CRDA will be placed in service at Baltimore-Washington International and Washington Dulles and will be available to the New York Terminal Radar Approach Control.

Center-TRACON Automation System (CTAS). CTAS is a set of integrated tools designed to achieve optimal aviation traffic flow. During FY 1994, CTAS design strategy shifted from individual tool development to a combined approach of producing four software components:

1) a Traffic Management Advisor (TMA) which sequences and schedules arrival traffic to minimize delays,

2) a Descent Advisor (DA) which provides fuel efficient speed, descent and heading advisories to assist center controllers in meeting the TMA schedules,

3) a Final Approach Spacing Tool (FAST) which provides runway assignments, sequence numbers, speed and heading advisories to assist terminal controllers in efficiently spacing aircraft on final approach; and

4) the Expedite Departure Path (EDP) which provides optimal climb profiles and routings for departure traffic in sequence with arrival streams.

CTAS is being developed at the NASA Ames Research Center, MIT Lincoln Laboratory, the FAA Technical Center, and the Denver and Dallas/Ft. Worth ARTCCs and TRACON's. The first limited operational assessment (LOA-1) of TMA was completed in February 1994 at the Denver ARTCC. This successfully validated the operational viability of TMA as a tool to determine peak demand periods and to develop optimized traffic arrival flows.

During FY 1995, Limited Operational Assessments (LOAs) of the Planning Advisor and the Passive Advisor will be conducted at the Denver and Dallas field sites, and a Full Operational Assessment (FOA) of the Planning Advisor will be conducted at the FAA Technical Center.

Aviation Weather. A National Aviation Weather Users' Forum in December 1993 attracted more than 200 representatives from Government and industry. The forum and subsequent workshops produced 55 high priority recommendations for improved aviation weather services, of which 33 were designated essential. The FAA and the National Weather Service will publish an action plan responding to the recommendations in FY 1995.

21ST CENTURY AVIATION

Build the 21st Century Aviation System

Air Traffic control technology is being transformed by parallel developments in three separate fields: satellites, computers, and digital communications. These new core technologies are the focus of much of the FAA's capital investments and operational planning. In FY 1994, the agency intensified its efforts to deploy these technologies in the U.S. National Airspace System and as part of an integrated global system of aviation.

Global Positioning System. The FAA is working with the industry and international agencies to make the benefits of the Department of Defense (DOD) Global Positioning System (GPS) available to the entire aviation community in the shortest time, consistent with safety. The thrust of the program is to (1) augment GPS to support all phases of navigation and landing, including precision approaches; and (2) transition from the current land-based navigation system to a satellite-based system.

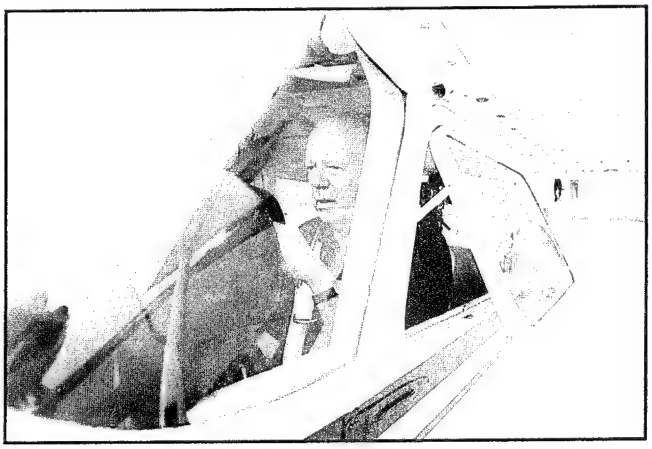
Significant achievements that highlighted FY 1994 are:

1) In December 1993, the GPS 24-satellite constellation achieved its initial operating capability (IOC). Then, on February 17, 1994, FAA Administrator David Hinson announced that aircraft equipped with a certified receiver could use GPS for supplemental navigation down to and including non-precision approaches. By 1997, the FAA expects all properly equipped aircraft will be able to use GPS as the sole means of navigation throughout the U.S. and over the oceans of the world.

2) The FAA certified the first GPS receiver less than a year ago. At least nine other U.S. companies have since entered the market. About a dozen or so receivers have been certified and others are awaiting approval. The agency also issued specifications for manufacturers who wish to build GPS receivers for Category I precision approaches, which involve a runway visual range of not less than 1,800 feet.

3) Early use of GPS is evident at five U.S. airports: Denton, TX; Aspen, CO; Steamboat Springs, CO; Frederick, MD; and Oshkosh, WI. These airports have non-precision approaches based on unique Terminal Instrument Procedures (TERPS) criteria for satellite navigation recently developed by the FAA. Moreover, airport officials and the FAA have installed a local area differential GPS base station at the Juneau Airport. The initial tests of the system proved very successful and further efforts are planned involving use of this technology by an air carrier.

4) In May 1994, the FAA certified the nation's first GPS non-precision approach procedure for a heliport. The new approach is located at Erlanger Medical Center in Chattanooga, TN. In just two months of service, faster emergency transport has been credited with saving a dozen lives. A second helicopter approach was certified in August at PHI Lake Palourde Heliport, Morgan City, LA. Procedures are nearing completion at two other heliports: The Mayo Clinic/Omniflight



FAA Administrator David Hinson prepares to fly the nation's first operational GPS approach with AOPA President Phil Boyer.

and the University of Wisconsin Hospital. Another milestone was reached on July 16, when FAA Administrator David Hinson and Aircraft Owners and Pilots Association (AOPA) President Phil Boyer landed at the Frederick Md, airport using the first FAA-approved public "stand alone" global positioning system instrument approach for aircraft.

5) A number of demonstrations were conducted, showing how GPS, coupled with an aircraft's flight management system, can fly unassisted precision approaches.

6) The FAA continued to work with NASA to use GPS to satisfy Cateory II and III precision approach requirements. The agency contracted with two major U.S. air carriers to use their Boeing 757s and with two avionics manufacturers to conduct Category III testing using GPS. The results will be presented to ICAO in 1995.

7) The Technical Center completed flight tests of the Stanford Integrity Beacon in autocoupled precision approaches. The flight tests demonstrated that Category III sensor accuracy was obtained.

8) In June, the FAA issued a request for proposals for a Wide Area Augmentation system, a network of ground stations and communications systems that will enhance the integrity and availability of GPS signals. The RFP is for a six-year contract to develop an initial system of 24 ground reference stations and ground and satellite communications systems.

9) The FAA Technical Center, in cooperation with Transport Canada Aviation, completed simultaneous flight tests of the GPS Wide Area Augmentation System (WAAS) at the Atlantic City Airport, NJ; Crows Landing Naval Auxiliary Landing Field, CA; and Hamilton, Ontario, Canada. The flight tests demonstrated the WAAS met the sensor accuracy requirements for Category I precision approach at three remotely spaced airports approximately 2,500 miles apart using one geostationary satellite.

10) The nation's first wide area differential GPS monitor and master control station were installed at Boston Center. Prior to installation, the New England region hosted a national briefing and training seminar.

11) Two Advisory Circulars were issued: one for airworthiness approval of GPS navigation equipment for use as a Visual Flight Rules and Instrument Flight Rules navigation system, and the other for airworthiness approval of flight management systems which integrate multiple navigation sensors.

12) During the fiscal year, the FAA worked with the International Civil Aviation Organization to promote the benefits of a worldwide Global Navigation Satellite System.

13) Given the speed with which satellite technology is improving, the FAA halted development of the Microwave Landing System in June 1994.

GPS Squitter. This project combines two relatively mature technologies to create a cost effective aircraft surveillance system capable of dramatically extending the availability of real-time aircraft surveillance information. The Global Positioning System (GPS) is used as the source of accurate real-time aircraft position information and Mode S is used to periodically squitter (broadcast) this information to both ground and airborne users within line-of-sight.

In tests conducted at Boston's Logan Airport in FY 1994, the GPS Squitter demonstrated 99+ percent reliability in tracking aircraft and other vehicles moving on the airport surface. Initial tests also successfully demonstrated the ability of the system to track airborne aircraft. The GPS Squitter technology will be tested in FY 1995 to track helicopters operating at low altitude over the Gulf of Mexico and conventional aircraft operating in terminal and en route

airspace, In FY 1994, work began within the International Civil Aviation Authority (ICAO) to develop standards for GPS Squitter for surveillance of aircraft by the ground air traffic control authorities and as a potential enhancement to the airborne collision avoidance system.

GPS Training. In FY 1994, 96 people participated in the newly-developed Global Positioning Satellite (GPS) RNAV Procedure course.

Satellite Operational Implementation Team (SOIT). This multi-disciplined team was formed to determine operational standards, limitations, and the methods for authorizing the use of new satellite technology and to be the focal point for resolving all operational issues. In July 1994, the team issued a position paper proposing minimum performance standards and operational restrictions for using GPS as a primary means of navigation for oceanic/remote operations.

Aeronautical Data Link (ADL). This program will provide digital communications between FAA computers, other ground based systems, and properly equipped aircraft via the Aeronautical Telecommunications Network (ATN), supplementing or bypassing the increasingly congested voice radio communications.

Many of the services planned for data link possess high potential for increasing air safety, efficiency, and capacity through error-free communications. Recent studies indicate major cost savings can be achieved by the aviation industry as a result of these improvements.

RTCA and ICAO have completed development of all necessary Minimum Operational Performance Standards and Standards and Recommended Practices for ADL, and the ATN Manual has been finalized and approved. Software development is underway in the Data Link Processor and Host computer systems which will enable a full range of ATN Data Link capabilities in both the en route air traffic control and flight information services area. The Mode-S subnetwork remains the primary NAS Data Link transmission medium, but plans include the future use of VHF Digital Radio and Satellite as well.

The FAA has developed an ATN engineering test bed that is currently being used to support the ATN, Satellite and Mode S data link standards validation.. Flight trials were successfully conducted in FY 1994 demonstrating the Satellite and Mode S air-ground data links and the flight test program will be expanded beginning in FY 1995 to support ATN with international and U.S. airline industry participation.

In addition, the Tower Data Link System which is now providing automated Pre-departure Clearance services at 30 airports is being enhanced to also provide digital Automated Terminal Information Service (ATIS) (with automated voice generation). This will be operational at 57 airports by mid-1996.

Mode S Program. In FY 1994, the FAA deployed 47 Mode S systems, bringing the total to 96 systems fielded from the procurement of 144 operational systems. The Mode S is an advanced secondary radar which provides both accurate surveillance and a built-in data link. The Mode S is a cornerstone of the ICAO FANS (Future Air Navigation System) concept, and the U.S. is the first country to proceed with full-scale deployment. Two sites (Orlando and Baltimore) have achieved full Mode S capability and a software upgrade is underway to retrofit this functionality at sites already in the field.

Datalink and Global Positioning Systems. During FY 1994 the Aircraft Certification Service issued a notice which provides guidelines for the airworthiness approval of airborne data link systems and their applications. Technical Standards Orders were developed which prescribe minimum operational performance standards for automatic dependent surveillance and minimum operational performance

standards for an airborne aeronautical earth station (satellite communication equipment).

Advanced Automation System. The FAA plans to replace the equipment now used by controllers with new computer software, processors, tower position consoles, and controller workstations. Following a series of independent reviews of the AAS program in FY 1994, the FAA restructured the program to contain cost growth and minimize delays. When completed, the restructured program will provide the same functions and benefits as the original program, but following a different implementation approach. The new systems will accommodate future air traffic growth and evolving technology, reduce delays, enhance system safety, and provide economic benefits to the users and the FAA.

In the en route environment, the most pressing need is for the replacement of antiquated controller displays and the computers that drive them. The new plan calls for a Display System Replacement which will provide controllers with a new workstation and peripherals. This replaces less reliable equipment, removes limits to sector growth, and provides the platform for further levels of automation and achievement of early user benefits. In late September, following a 90-day analysis by independent experts, the FAA announced that it would seek a proposal from the Loral Corporation for completing the en route controller work station program.

The tower segment of the AAS program will provide technical enhancements, a computer-human interface, and allow the consolidation of various automation capabilities into a single efficient system. This will ease the problem of physical space shortages in the towers, enhance safety, and provide a platform for further automation.

In the terminal environment, the plan includes short-term projects to replace or upgrade aging and inflexible Automated Radar Terminal System (ARTS) subsystems which inhibit fielding of user benefit capabilities. The longer-term solution requires proceeding with the Stand-Alone TRACON Replacement (STARS) project, based on commercial products and technology, to remove functional limitations and facilitate the phased introduction of user benefit capabilities.

Terminal Area Surveillance System (TASS). The TASS is the FAA's program to develop the next generation terminal ground based, multifunction sensor (radar) system for hazardous weather detection and prediction and for aircraft surveillance. The agency's research and development investment in TASS technologies and applications has been highly leveraged through cooperative research and development agreements for technology transfer with substantial industry investment; significant cost-sharing in competitively awarded Broad Agency Announcement (BAA) research/study contracts; and the FAA's participation in the President's Technology Reinvestment Project (TRP) initiative administered by the Advanced Research Projects Agency (ARPA).

In FY 1994, the program completed initial capacity simulations that demonstrated a five percent increase in capacity is achievable with the TASS sensor; awarded BAA contracts for simulations to determine the value of capacity benefits and architecture studies for multifunction phased array radars; and established under the TRP a $16 million cooperative agreement between Martin Marietta and ARPA whereby the TASS program office will provide technical input during the development of major subsystems of a single fixed-face phased array radar, including transmit/receive modules.

Integrated Terminal Weather System (ITWS). This system delivers improved aviation weather products from various FAA and National Weather Service sensors as well as aircraft in flight, and provides a unified set of safety and planning weather products. These products include information on terminal winds and storms, predictions of microbursts, and

ceiling/visibility forecasts in a format that makes them immediately usable by air traffic control personnel without further meteorological interpretation. The ITWS will be deployed at the 45 airports which will have Terminal Doppler Weather Radars.

In FY 1994, an air traffic controller working group assisted in refining the full suite of initial operational capability (IOC) products. The products underwent a very successful operational test and evaluation at Memphis and Orlando. A data link which supplied some ITWS products directly to aircraft was very well received by pilots and air traffic personnel. Studies of the ITWS benefits to the ATC system were also performed.

FAA Aviation Research Grants. Over $25 million dollars in aviation research grants was awarded in FY 1994. Projects focused on aviation security, aircraft and airport safety technology, the effects of weather on aviation, human factors and operations research.

Congress requires that the FAA invest 15 percent of its total RE&D budget on long term research, and no less than 3 percent on research grants. The value of all aviation research grant awards, to date, exceeds 8 percent. This increase is expected to continue in future years. Grants stabilize RE&D programs planning by funding three or more years of research in any particular area. Moreover, they provide access to forefront ideas and emerging technologies and foster professional contacts between FAA technical personnel and representatives at quality institutions.

FY 1994 Grants, By Category
(In Millions of Dollars)

Aviation Security	$ 11.5
Aviation Safety	8.0
Human Factors and other	5.5
Total, FY 1994	25.0
Total, all years	$ 73.2

INDUSTRY VITALITY

Help Improve industry vitality and viability

REDUCING THE REGULATORY BURDEN

Regulatory Activity - General. FAA is working closely with the aviation community in drafting rules that will have an eventual impact on the industry. Rule formulation is being conducted with the participation of a 64-member Aviation Rulemaking Advisory Committee (ARAC) representing virtually every segment of American aviation. Its membership also includes representatives from Europe and Canada. As a result of its international composition, the ARAC has been recognized as the U.S. forum for harmonizing the U.S. Federal Aviation Regulations with those of Europe. Broad participation helps ensure that FAA's regulatory decisions are based upon the best information available.

The FAA moved to reduce the regulatory burden on the industry, following up on a recommendation from both the National Commission to Ensure a Strong Competitive Airline Industry and from Vice President Gore's National Performance Review. The agency invited the public to identify any regulations which could be amended or eliminated without compromising the FAA's statutory responsibilities for safety, security and the public interest. A public notice (published on January 10, 1994) asked those who replied to identify three regulations that they believe were unwarranted or inappropriate and to rank these three in order of priority. This public input is expected to contribute significantly to the agency's future regulatory efforts.

High Density Rule. Commonly known as the "slot rule", this 25-year-old regulation limits

hourly scheduled takeoffs and landings at four of the nation's most congested airports: New York's LaGuardia and Kennedy, Chicago O'Hare, and Washington National. Evaluating the rule is part of the Clinton Administration's Initiative to Promote a Strong Competitive Aviation Industry, which was announced in January. A thorough examination of the slot rule to assess airline capacity, competition, fares and service patterns at the four airports was begun in mid-1994. Meetings designed to obtain public comment were held in October. Any future changes in the rule would require rulemaking accompanied by a full public proceeding. In the case of National Airport, legislative change would be required.

Renewal of Flight Instructor Certificates. On April 13, 1994, FAA published a rule that permits holders of flight instructor certificates to renew their certificates by completing an approved number of hours of ground or flight instruction, or both, in an approved flight instructor refresher course. This rule reduces the financial burden placed on individual flight instructors.

CERTIFYING NEW AIRCRAFT AND ENGINES

Certification of Pratt & Whitney Engine for the Boeing 777.

The Boeing Company B-777 aircraft will be powered by two high bypass ratio turbofan engines manufactured by either Pratt & Whitney, General Electric, or Rolls Royce, depending upon the decisions of the buyers. All primary certification tests demonstrating compliance to Federal Aviation Regulation (FAR) Part 33 have been completed on the three Pratt & Whitney engine models designated for the B-777. The type certificate for the three Pratt & Whitney turbofan engine models was issued in April and a Pratt & Whitney powered B-777 completed its first flight in the summer of 1994. Pratt & Whitney powered B-777 aircraft are expected to enter into service in August of 1995.

Certification of a New Generation of Small Airplanes. The FAA has certificated the first three airplanes belonging to a new generation of affordable recreational and training aircraft. The Small Airplane Directorate worked with Transport Canada to certificate the Zenaire CH2000 and the Diamond Katana under the new Simplified Small Airplane Certification Program. The Quicksilver GT500 received its final type certificate under the sportplane provisions of Primary Category. Six new aircraft were certificated under FAR 23: The Zlin 242L, Koliber 150A, Ruschmeyer RG 90, Grobe 515T, Grobe 520, and the Jetcruzer 450. The FAA Administrator presented the Type Certificates to Quicksilver, Zenaire, and Diamond at the 1994 EAA Convention.

Early Extended Range Operations (ETOPS) for the Boeing 777. The FAA issued special conditions for the certification of the twin-engine Boeing 777 to allow for immediate introduction of the airplane into extended range two-engine operations (ETOPS). The exacting conditions set by the FAA will assure that all safety standards will be fully met without the service experience which is currently a prerequisite for ETOPS approval. These conditions include unprecedented engine and airplane testing, in addition to the normal aircraft engine and transport category airworthiness standards, and other special conditions that pertain to the novel or unusual design features of the airplane.

FOSTERING AIR TRANSPORTATION

St. Louis Gateway Transportation Center. The city of St. Louis plans to develop a multimodal transportation facility to accommodate Amtrak, Greyhound, MetroLink, commuter rail and helicopters. The FTA has awarded a grant to the city for a site selection and design study, expected to be completed in about two years. AIP funds and other modal funds are being used to partially finance this study. The proposed facility will expand access to the airport and provide alternate locations for airport parking, airline ticketing and baggage check-in.

Present plans call for the multimodal complex to be operated and managed by the St. Louis Airport Authority.

Airport and Airspace Capacity Tactical Initiatives. An Airport Capacity Enhancement Terminal Airspace Study for San Bernadino, CA, evaluated the capability of commercial operations at the former Norton Air Force Base. An evaluation was also made of the potential use of Boeing 777 folding wing aircraft at New York LaGuardia. A final report is due in the first quarter of FY 1995.

Layer Elastic Designs for Airport Pavements. The FAA has completed the development of the layer elastic design (LED) procedures for airport pavements. The availability of LED as an optional standard for airport pavement design is an important step in preparing for the introduction of new generation aircraft, particularly the Boeing B-777 which will enter commercial service in May 1995. The FAA has also designed a new airport pavement test machine which is expected to be in operation by January 1997. Data provided by the machine will be used to evaluate innovations in pavement design.

Airport Pavement Monitoring at the Denver International Airport: The FAA has completed the instrumentation of runway 16L/34R at the new Denver International Airport, installing more than 500 sensors to measure the real-time performance characteristics of airport pavements. Computer data-link was established between the FAA Technical Center and the on-site system of sensors which will enable the FAA to continuously monitor the effects of aircraft loads on the airport pavements.

REVIVING GENERAL AVIATION

General Aviation Action Plan. On September 8, 1993, Administrator Hinson signed a General Aviation policy statement which commits the FAA to work with the industry in promoting the vitality of general aviation in the U.S. The details of the collaboration are laid out in a plan of action which covers safety, FAA services, product innovation and competitiveness, system access and capacity, and affordability. The Plan was announced at the General Aviation Forecast Conference in San Antonio, Texas by Deputy Administrator Linda Hall Daschle.

Advanced General Aviation Research Simulator. The Civil Aeromedical Institute (CAMI) has acquired a high fidelity, reconfigurable cockpit simulator for use in general aviation research. Studies planned for next year will address pilot performance and aircraft systems interactions in high performance, pressurized, single-engine aircraft.

MAINTAINING HIGH STANDARDS OF SAFETY AND PROFESSIONALISM

National Examiner Board (NEB). Formally constituted as a board on October 5, 1994, the NEB is composed of representatives of several Flight Standards divisions and provides support for the designated examiners who are responsible for the majority of certification services provided in the United States. The Board is also responsible for maintaining the files of examiner applicants.

Airman Certification and Rating Application. The prototype for this on-the-spot electronic system for transmitting certificate data will eliminate 62 percent of all manual steps, cut the time from 120 days to 4 days, and reduce the need for paper. Eventually, certificates can be issued immediately upon certification and will include a color photo, signature, holographic overlay, bar code, magnetic strip, and a smart card on a 64K chip which contains the pilot's history and medical record.

Flight Standards Bulletin Boards. Flight Standards operates several electronic bulletin boards to update its customers on aviation-related matters. The Regulatory Support Division, located in Oklahoma City, runs

the Pilot Examiner BBS to disseminate technical information to flight instructors and pilot examiners. The Orlando Flight Standards bulletin board logs over 100 calls a day from pilots inquiring about certification procedures, safety issues and FAA Advisory Circulars. The Portland Flight Standards BBS serves commercial pilots and the operators of air taxi services. And the bulletin board run by AFS-200 handles up to 20,000 calls a year. Intended to meet the needs of the entire aviation community, the AFS-200 BBS is a comprehensive repository of information distributed by Flight Standards.

SUPPORTING RESEARCH ON NEW AVIATION TECHNOLOGY

High Speed Civil Transport. The FAA and the National Aeronautics and Space Administration (NASA) are collaborating in a joint effort to support the development of the High Speed Civil Transport (HSCT), the next generation of supersonic aircraft. Based on technological and market forecasts, the U.S. aviation industry has projected that the HSCT can be introduced by the year 2006. This new type of aircraft is expected to incorporate many innovative technologies and fly at speeds and altitudes not envisioned when existing airworthiness standards were codified. The FAA, working closely with NASA, is committed to develop, by 1998, a preliminary basis for certification for the HSCT which will allow the U.S. industry to decide whether it is feasible to meet the prescribed airworthiness standards.

Airport Pavement Design Criteria Development. FAA began research to develop airfield pavement design specifications for the new generation of large aircraft expected to weigh more than a million pounds. In conjunction with that effort, analysis of the airspace requirements led to a change in airfield design standards for clear airspace. The refined "obstacle free zone" will safely accommodate current and future large aircraft while minimizing the need to modify many current procedures and taxiway configurations.

The FAA's portfolio of stimulation models -- including the Airfield Simulation Model, the Airport and Airspace Simulation Model and the National Airspace System Performance Capability -- continued to be refined and upgraded.

Centers of Excellence. The Congressionally mandated collaborative Centers of Excellence program with Rutgers University and Georgia Institute of Technology enters its second year. Current research on the computational modeling of aircraft structures, budgeted at $13 million for four years, will be augmented with a new $5.5 million, three year program of airport pavement research at a university still to be selected.

Technology Transfer. The FAA invests heavily each year in research, engineering and development. Through technology transfer, companies in the private sector can exploit this resource to develop new products for U.S. and overseas markets. The Cooperative Research and Development Agreements (CRDA) are the means by which private firms can gain access to the knowledge and expertise of the FAA. In 1994, the Technology Transfer Program office managed 35 active CRDAs, began 75 new ones, and is in the process of initiating eight others. Twelve were completed. The FAA promotes industry awareness of the Program and cooperates with similar organizations at the federal, state and local levels.

Small Business Innovation Research Program. This Congressionally mandated program is intended to encourage small businesses to participate in government-sponsored R&D projects. In 1994, the FAA funded four new projects, each selected from proposals submitted for competitive evaluation. The agency continued support for eight others.

Innovative and Cooperative Research Programs. To assure ready access to new ideas and technologies, the FAA has developed a number of approaches to encourage interactions between FAA technical staffs and researchers at

universities, federal laboratories and R&D facilities in the private sector.

INTERNATIONAL LEADERSHIP

Provide U.S. international leadership in creating a safe, efficient global aviation system.

MAINTAINING A SAFE SYSTEM

International Cooperation. FAA officials began discussions with their international counterparts to establish regional groups to harmonize safety regulations, and, in cooperation with the Department of State, to develop aviation safety agreements expanding the cooperative working relationships with other civil aviation authorities. The FAA also established a Crisis Response Working Group to monitor emergency situations and take actions to ensure safety of flight operations in troubled areas such as Yemen, the former Yugoslavia, Afghanistan, and Haiti.

National Simulator Program. In response to requests from the Department of State, a five-member team traveled to Guanghan, Peoples Republic of China, to conduct an evaluation of three simulator and two flight training devices. This was the first U.S. evaluation of this type conducted in China.

HARMONIZING RULES AND PROCEDURES

Aircraft Certification Program In China. I n 1994. the FAA completed its assessment of the General Administration of Civil Aviation of China's (CAAC) system for certification of small aircraft. In the future FAA and CAAC are expected to conclude new implementation procedures expanding the Bilateral Airworthiness Agreement (BAA) currently in place with the People's Republic of China. This expansion will allow the acceptance of Chinese small aircraft such as the Y-12 (IV) into the U.S.

Bilateral Agreements on Repair Stations. FAA and Joint Aviation Authority (JAA) are working on bilateral agreements to standardize repair station certification practices among participating countries. In FY 1994, the two organizations outlined the terms for operating within the bilateral agreement, completed the first phase of a three-phase evaluation plan for maintenance practices, completed joint evaluations and subsequent analysis on 17 foreign-based facilities, and drafted agreements on standard maintenance procedures.

Harmonization of Rotorcraft and Small Airplane Regulations. In many instances, American aircraft manufacturers have had to modify their designs to meet additional requirements of some international civil aviation authorities in order to export their aircraft. The FAA initiated a program to harmonize the certification regulations and their applications with those of the Joint Aviation Authorities of Europe. The aircraft manufacturing industry identified this effort as a top priority needed to stimulate economic growth. A major rulemaking package, which proposes to harmonize the requirements for commuter and small airplanes, was published for comment in July and subsequently and approved by FAA. The first harmonization rulemaking package for rotorcraft was published in the Federal Register in December 1994. Both proposed rulemaking packages were developed in collaboration with the Aviation Rulemaking Advisory Committee (ARAC).

Harmonization of Transport Airplane Regulations. FAA has been working with its counterparts in Europe to harmonize the transport-category airplane requirements in Part 25 and JAR 25. FAA published the first proposal, which would harmonize the flight test requirements, on April 22, 1994.

BUILDING A GLOBAL SYSTEM: COORDINATING COOPERATION ACROSS NATIONAL BOUNDARIES.

Global Air Traffic Control. FAA participated in ICAO regional planning and implementation groups and other international forums to foster development of the Global Navigation Satellite System (GNSS) and to use the U.S. Global Positioning System (GPS) as a first step in realizing a global Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM) system.

FAA hosted a CNS/ATM planning group for the Caribbean/Latin American region, and provided seminars for officials from the Asia Pacific region, Latin America, and Europe.

Under the North American Free Trade Agreement, FAA organized an international working group to begin planning for a seamless satellite-based regional air traffic control system for Mexico, Canada, and the United States.

Satellite Communications. The FAA has taken the lead within the international aviation community to develop and validate the standards for airborne and ground satellite communication systems. In FY 1994, an ICAO technical panel approved the standards for the Aeronautical Mobile Satellite System for air-ground voice and data communications. The FAA conducted extensive data collection and analysis efforts, as well as the development of a high fidelity simulation model in support of the validation of the proposed standards.

International Routes. The FAA continued coordination with the civil aviation authorities in Canada, Russia, China, and Japan to develop fuel efficient great circle routes between North America and the Orient transiting Russian Far East (RFE) airspace. The FAA also briefed Russian military authorities on the development of a joint use (military and civilian) airspace system. Consequently, altitudes previously restricted for use by military aircraft were made available to international air carriers. As these concepts continue to be incorporated, additional routes will be made available for civilian use.

During FY 1994, the FAA Alaskan Region received a USIA grant to conduct multiple meetings and exchanges with Russian civil and military aviation counterparts. Agreements were reached to open additional airspace, increase capacity, enhance technical communications, and increase cooperation on aviation safety and security in the Russian Far East. These efforts also resulted in the opening of additional airports to U.S. air carrier operations, furthering the growth of air commerce.

United States/Mexico Air Traffic Control System Interface Enhancements. The FAA has continued to pursue state-of-the-art interfaces between Air Traffic Control (ATC) systems with Mexico and Canada. The Southwest Region is currently working on initiatives that include satellite earth stations which access Mexico's satellite network with availability scheduled for mid 1995, as well as proposals for a direct ATC system en route computer to computer interface. The proposed computer interface would include the exchange of flight data, and selected secondary radar information. Representatives from Canada have been included in the discussions with a goal of utilizing a common strategy to support a seamless ATC system for all of North America.

Gulf of Mexico Communications. In March 1994, FAA began engineering a direct pilot/controller communications system for use in the Gulf of Mexico. The system will operate from remote communication air/ground (RCAG) equipment installed on offshore buoys. In addition to the offshore RCAG sites, the land based communication and navigation facilities are being enhanced. The FAA is preparing to test RCAG equipment on a 2,000 foot antenna located 20 miles north of New Orleans. Using 2,000 foot antennas to increase frequency coverage was proposed by the National Air Traffic Controllers Association.

Merida Flight Data Input Output (FDIO) Test Facility. Following negotiations with Servicios a La Navegacion en El Espacio Aero Mexicano (SENEAM) and coordination with the U.S. Government and Mexico Customs the FAA installed a FDIO test facility in Merida, Yucatan, Mexico. Testing began in January 1994 between Merida Area Control Center and Houston Center. FAA employees from the Southwest Region also provided on-the-job training for SENEAM maintenance technicians in Merida.

Gulf of Mexico. Houston Air Route Traffic Control Center began using a Mach technique procedure with Merida and Monterey Area Control Centers in September 1994. The procedure standardizes aircraft speed control for air traffic in the Gulf of Mexico. As a result, air traffic capacity for each airway in the Gulf has been increased.

Technical Assistance. Training was arranged for 475 international aviation officials. Specialized air traffic controller training was provided to Morocco, Tunisia, Spain, and India. FAA hosted about 1200 visiting foreign aviation officials, providing first-hand exposure to operations and standards of the U.S. aviation system. FAA has 348 agreements in place for technical cooperation or aviation development with 87 countries and international organizations.

International Aviation Inspections. To eliminate wasteful duplication in providing inspectors in Central and South America, a joint memorandum of agreement was developed by the Miami, Ft. Lauderdale and San Juan Flight Standards District Offices and the Miami International Field Office. A team composed of members from each office evaluated the certification and surveillance requirements of each country in the Americas. As a result, the team now recommends, on a periodic basis, those resources which need to be assigned to a particular inspection effort in order to avoid costly duplication. The result has also enabled inspectors to perform other important aviation safety activities elsewhere within the Southern Region.

Cross-organization International Committee. The Southwest Region has developed a cross-organization committee to work on aviation safety issues confronting the U.S., Canada and Mexico, including matters stemming from the North American Free Trade Agreement. Working committees composed of representatives of the Mexican Director General, Civil Aviation, the Canadian Ministry of Transportation, and the Flight Standards Service meet periodically for discussions. Each of the three aviation authorities have hosted a meeting in their respective countries. A strategic plan for improving aviation safety was developed with our Mexican counterparts.

Flight Standards Support of Aviation Activities in Mexico. The Dallas/Fort Worth Flight Standards District Office (DFW FSDO) has responsibility for the certificate management, inspection and surveillance of FAR Part 129 Foreign Air Carriers, and FAR Part 145 Certificated Repair Stations in Mexico. A team in the DFW FSDO has responsibility for Mexican operators in addition to other assigned U.S. aviation operators. During the past year over 1,000 U.S. special purpose airman certificates were issued to foreign airmen employed by Mexican air carriers that are U.S. registered and operate outside of Mexico.

Air Traffic Controller Selection. The Civil Aeromedical Institute (CAMI) is participating in an international research program on air traffic controller selection in coordination with the Netherlands and Sweden. The test being considered is a customized version of the FAA's computer-administered Pre-Training Screen. The goals of the joint research program include identifying commonalities in the controller's job, development of common selection criteria as appropriate, and identification of similarities and differences in job performance dimensions.

PROMOTING U.S. AVIATION

Promotion of U.S. Aviation Standards. FAA Administrator Hinson hosted the 29th Annual Asia Pacific Director General's Conference in Los Angeles in November 1993. The event, which highlighted U.S. GNSS concepts and demonstrations, was attended by 100 or more aviation officials from 40 countries. U.S. aerospace firms provided technical exhibits.

The FAA also participated in the Singapore Airshow in March 1994. And, in that same month, Administrator Hinson attended the Chile Air Show in March 1994. The visit provided the Administrator the opportunity to meet his Latin American counterparts and promote U.S. GPS standards and techniques. This was the first visit by an FAA Administrator to South America.

Agency officials worked with the Trade Development Administration and other U.S. agencies on trade missions and other events to promote U.S. aviation technology, aerospace products and services, including conducting seminars for Latin American and Central European officials.

International Exchange Visitor Program. Dr. Eduardo Mera Ospina, Medical Director of the Colombian Air National Police, is spending one year at the FAA's Civil Aeromedical Institute. Dr. Ospina is the program's first participant.

International Training Strategic Business Plan. The FAA Academy completed its first strategic business plan to address the growing demand for global civil aviation training and technical assistance. The plan will be reviewed annually and will serve to guide the FAA Academy's future decisions in support of global aviation. During FY 1994, the Academy's international activity increased dramatically over the previous year. International enrollments include participants from Morocco, Tunisia, India, Indonesia, and Macedonia. Proposals for additional training were also made to Saudi Arabia and Indonesia.

ENVIRONMENTAL RESPONSIBILITY

Ensure that aviation shoulders its full environmental responsibility in a way that minimizes the burden on the industry.

REDUCING AIRCRAFT NOISE

Transition to Stage 3 Aircraft. The Airport Noise and Capacity Act of 1990 set national aviation noise policy and provided for the transition to a quieter Stage 3 airplane fleet by December 31, 1999. The FAA established rules for implementing this policy, calling for interim compliance dates and annual reporting by foreign and domestic operators. The reports for the year ending December 31, 1993 indicate that Stage 3 aircraft constituted 62.4 percent of large turbojet fleets operating to and from U.S. airports. For the preceding year (1992), the comparable figure was 54.5 percent. The next interim compliance date is December 31, 1994.

Airport Noise Compatibility Planning Program. The Part 150 program assists airport operators in developing comprehensive noise compatibility programs (NCPs) to reduce noise and achieve compatible land uses in the areas surrounding their airports. To date, 170 airports have FAA-approved NCPs, and the agency has issued more than $38 million in grants to develop the programs and at least $1 billion, 370 million for their implementation. Last year, FAA approved 22 NCPs, three of which were major revisions/updates of existing programs. Grants for approximately $4.1 million were awarded for noise compatibility planning and $218 million for noise compatibility projects. It is expected that over the next several years, a major area of Part 150 activity will be the revision and updating of previously approved NCPs to reflect progress in phasing out large Stage 2 airplanes.

Subsonic Noise Reduction Technology Research Program. The Airport and Airway Safety, Capacity, Noise Improvement, and

Intermodal Transportation Act of 1992 mandates that the FAA and NASA jointly conduct a research program to develop, by the year 2000, new technologies for quieter subsonic jet aircraft engines and airframes. The program is funded mainly by NASA, with the FAA contributing a smaller share. Working with representatives of the U.S. aerospace industry, the two Agencies have set, as the overall program goal, a 10 decibel noise reduction (relative to 1992 technology) and have developed a research plan for producing the required technological advances.

Two revised computer models were released: the Integrated Noise Model Version 4.11, with capabilities for analyzing terrain, run-up operations, and varying airport temperature and elevation; and Version 2.2 of the Heliport Noise Model, featuring more helicopter performance data and improved methods of track definition and taxi procedures. The agency also established a broad government-industry review committee to oversee future FAA noise modeling.

REDUCING EMISSIONS AND CONTAMINATION

Aircraft Emissions and the Environment. FAA began participation in the NASA Atmospheric Effects of Aviation Project to develop a scientific basis for assessing the atmosperhic impacts of subsonic and supersonic aviation, particularly commercial aircraft cruise emissions. The agency also completed a joint study with EPA concerning the control of nitrogen oxide emissions from uninstalled aircraft engines in enclosed test cells. The agency released Version 94-4 of the Emissions and Dispersion Modeling System with enhancements to meet requirements of the Clear Air Act Amendments of 1990 and the California Federal Implementation Plan. Among these enhancements is the ability to assess emissions from aircraft ground support equipment.

Fuel Storage Tank Clean-up. The clean-up of contaminated FAA sites continued last year with approximately 1,000 fuel storage tanks upgraded to comply with EPA standards. In Alaska alone, for example, 47 tanks were removed and another 27 replaced. Within the next four years, 2,100 additional tanks, nationwide, will be brought up to standard. The estimated cost of the clean-up is $121 million.

Facility Environmental Protection. The FAA has begun a systematic program of audits and assessments at its facilities to identify sites requiring environmental cleanups. Steps were taken, as well, to prevent the unknowing acquisition of contaminated property and to regulate the use of chlorofluorocarbon and halon containing substances. A baseline inventory of toxic substances is being developed against which future reductions can be measured.

Controlling Environmental Effects of Deicing. While an essential procedure for flight safety, airplane deicing can foul nearby land and surface waters. To help control such adverse effects, the FAA has approved projects for the construction of upgraded deicing facilities and storm water collection systems, using AIP funds and income from passenger facility charges. Under the AIP, for example, over $13 million has been spent for deicing installations at nine airports. Research is underway, in collaboration with NASA and the industry, to develop deicing and anti-icing materials and procedures which may reduce the danger of environmental contamination.

CONSERVING ENERGY

FAA Energy Conservation Program. A coordinated effort has been launched to conserve energy at the thousands of FAA buildings and facilities. This initiative reflects the broadened scope of the FAA Energy Management Plan, which was expanded (in December 1933) to cover specific requirements of the Energy Policy Act of 1992 and Executive Order 12902, Energy Efficiency and Water Conservation at Federal Facilities.

INVOLVING THE PUBLIC ... COORDINATING WITH OTHER GOVERNMENT AGENCIES

Community Involvement Program. The FAA is preparing a community involvement training course for personnel who deal with the public on aviation-related issues, particularly those pertaining to the environment. The course is designed both to apprise managers of the importance of involving the community and to describe methods for establishing successful outreach programs.

Interagency Agreement Regarding the Endangered Species Act. The FAA joined 11 other Federal bodies in agreeing to coordinate efforts to protect threatened and endangered species.

Environmental Protection Administration/ Aviation Industry Forum. In FY 1994, FAA Administrator David Hinson and EPA Administrator Carol Browner established senior level contacts to coordinate issues between their two agencies and held three EPA/Aviation Forums to address matters of mutual concern.

FAA ORGANIZATION

Operate the FAA organization like a business, and as a model federal workplace.

RE-ENGINEERING THE FAA: STREAMLINING FOR GREATER RESPONSIVENESS AND PRODUCTIVITY

New Research and Acquisition Organization (AXA). A new structure has been established which integrates the FAA's procurement, research, and development functions into a seamless process focused on customer needs and speeding products to the users.

At the heart of the new organization are Integrated Product Teams (IPT), which will have life-cycle responsibility for their products, from applied research until their eventual retirement from the system. These multi-functional, empowered teams bring together all organizations involved in the system, including users and suppliers.

Experience from three prototype IPTs will provide refinements that will be incorporated when the concept is extended across the FAA during FY 1995.

Airway Facilities (AF) Strategic Planning. Airway Facilities began strategic planning in 1991 to improve services and efficiency, an initiative which has since been mandated, government-wide, by the National Performance Review. Now in its third cycle, the AF Plan focuses on long-range customer needs and the organizational changes required to meet those needs. The latest edition of the plan, published in September 1994, reflects further planning to consolidate field offices and streamline functions. An updated performance plan for 1996 was released in November 1994.

Government Performance and results Act (GPRA). In January 1994, Airway Facilities was designated as a pilot program under the Government Performance and Results Act (GPRA). In 1997, all federal agencies will be required to perform strategic planning to support resource requirements. The pilot program is designed to provide prototypes to other Federal agencies.

Airway Facilities was one of four DOT organizations chosen for the pilot program. This responsibility entails developing performance measurements around specific goals which must be tied to strategic initiatives. AF has designated four areas for measurement:

1) Engineering and Implementing Systems and Equipment: Improving the acquisition process within AF to speed up delivery, simplify implementation, and improve he quality of new systems.

2) Life-Cycle Management: Identifying system costs and cost/performance relationships for better decision making.

3) Organizational Change: Creating an environment which fosters diversity, teamwork, skill development, and managerial flexibility to improve efficiency.

4) System Operation: Establishing Operations Control Centers (OCCs) to provide improved service with fewer resources.

Airway Facilities Realignment. In August 1994, the FAA Administrator approved AF's plan to restructure its organization and realign its services to better meet the challenges of a new generation of technology in an era of downsizing and smaller budgets.

As a result of the realignment, the AF organization will actually increase the percentage of its technical staff which directly support aviation systems, equipment, and facilities. The employee to supervisory ratio is projected to increase to 15:1 by the end of 1998. Structural changes include reducing the organizational levels from five to three and consolidating engineering, administrative, and supervisory support functions. The transition from 77 sector offices in 1994 to 33 system management offices in 1998, will not reduce the presence of AF at any sector office location or curtail AF services in the operation and maintenance of the National Airspace System.

Six organizational behavior teams were formed to look at new approaches in selecting, training, empowering, compensating, rewarding, and measuring performance of the AF work force. The work of these teams has received national attention from other government agencies who are also interested in changing their incentive systems. The proposed designs were incorporated into FAA's successful bid to become one of the Government Performance and Results Act pilot projects.

The changes outlined in the realignment plan are scheduled to take place now through 1998.

Human Resource Management. The Business Plan for Reinventing Human Resource Management, issued in October, 1993, presents a new approach to the management of human resources in an FAA which is undergoing fundamental reorganization. The Plan identifies key HRM functions which are to be streamlined, delegated or abolished entirely. Standard HRM procedures for two major functions -- filling positions and determining pay -- are already being redesigned.

The revamped processes will be fully in place by the end of 1997. Training is the next function which will be "reengineered." HR organizations are now flatter and less hierarchical than a year ago: the employee to supervisor ratio has doubled and several layers of supervision have been eliminated.

Logistics Center. The FAA Logistics Center provides purchasing, inventory management, quality assurance, repair and customized fabrication services for more than 28,000 National Airspace System (NAS) facilities throughout the world, 46,000 NAS systems and 46 agency aircraft. The Center maintains an inventory of 105,000 items (valued at $456.8 million), stored in 12 acres of automated warehouse space and on 17 acres of outdoor storage.

In step with the rest of the FAA, the Logistics Center is moving away from its traditional functional structure to one which corresponds to the agency's new customer-defined lines of business, This basic restructuring, relying on teams to provide integrated product support, has reached 80 percent of our workforce, reducing the number of supervisors and improving internal communications. By next year, streamlining should achieve a supervisor-to-employee ratio of 1:15.

Aircraft Certification Service. An Aircraft Certification Service Design Group (also known as Fresh AIR) was chartered to critically examine the structure of the Aircraft Certification Service and to identify and analyze organizational

alternatives which would improve responsiveness and efficiency. Team members came from Aircraft Certification, as well as, the Flight Standards Service and from industry. Fresh AIR, after extensive discussion, offered two alternative models for Aircraft Certification. During the coming year, the many and complex implications of these alternatives will be thoroughly explored.

Civil Rights Mediation and Alternative Dispute Resolution Programs. In a effort to reduce internal discrimination complaints, FAA organizations are using numerous mediation techniques for early resolution of discrimination complaints. As a result, some 90 complaints were resolved in FY 1994, compared to roughly 70 complaints in FY 1993.

The FAA is a major participant in the Department of Transportation pilot Alternative Dispute Resolution (ADR) program. This program gives complainants the opportunity to seek resolution of problems with the help of impartial mediators. Five FAA employees were trained to serve as mediators. In addition, the Office of Civil Rights, using the Federal Mediation and Conciliation Service, trained more than 30 FAA employees nationwide to serve as mediators. The results, so far, have been promising. In the Southern Region, for example, a total of 134 complaints were received. Of these, 62 were successfully resolved, 51 through informal processes.

Civil Rights Disadvantaged Business Enterprises (DBE) Programs. The proposed new rule regarding the DBE Program is expected to be published in FY 1995 as a draft final rule. In June 1994 FAA Administrator David Hinson was the keynote speaker at the Disadvantaged Business Enterprise Compliance Conference in Cleveland, OH. Mr. Hinson told the audience that every year since 1988, when the DBE legislation was first enacted, the FAA has surpassed its statutory goal of not less than ten percent for federally assisted projects. He also remarked that nation-wide statistics on the concession program were being compiled and commented on proposed new rules which would expand the definition of disadvantaged businesses and reduce the amount of paperwork required to receive certification.

Significant accomplishments in FY 1994 include:

- Disadvantaged Business Enterprises (DBE) received $363.3 million or 20.3 percent of $1.8 billion awarded under Airport Improvement Program funded contracts. Firms owned and operated by women accounted for 7.3 percent of the total, while firms owned and operated by minorities and other disadvantaged individuals garnered 13.0 percent.
- The Southwest Region completed two comprehensive Disadvantaged Business Enterprise (DBE) Program compliance reviews at the San Antonio International Airport and Dallas/Fort Worth International Airport. These reviews corrected significant non-compliance problems including faulty DBE certification procedures and ineffective organizational structures/procedures.

The Western Pacific Region reported significant increases in the level of disadvantaged business enterprise opportunity. In FY 1994, participation reached 10.8 percent in concessions. The Southern Region reported that concessionaires at airports with more than 10,000 or more enplanements earned $729,653,100, of which $90,373,300 (12.4%) was earned by disadvantaged business enterprises (DBE's).

RECOGNIZING THE CHANGING NEEDS OF A CHANGING WORKFORCE: NURTURING OUR HUMAN RESOURCES

Workforce Diversity. The FAA approach to diversity, outlined in its diversity action plan, includes training for diversity awareness, increasing the representation of groups which are now under-represented in all occupations and grades, and creating a hospital workplace environment.

Diversity training is a major component in the FAA's plans to achieve its goals for diversity. In FY 1994, approximately 8,800 FAA employees attended diversity workshops. In all, more than 20,000 employees have participated in various aspects of diversity training since the program began. In September, the FAA Administrator announced that the agency would enact strict guidelines to make certain that its training was both appropriate and effective.

Partnership Through Empowerment. Partnership Through Empowerment (PTE) is a Southwest Region initiative undertaken in cooperation with the National Association of Air Traffic Specialists (NAATS). This program is designed along the same lines as the nationally sponsored Quality Through Partnership (QTP) agreement with the National Air Traffic Controllers Association (NATCA), utilizing team building and problem solving techniques to teach air traffic control employees to work together with management in resolving issues of mutual interest. The team building process builds trust and communication, and helps all employees recognize the value that each person brings to the work environment.

The program is underway at three Southwest Region automated flight service stations (AFSS), and at one flight service data processing system location. Training has commenced at a fourth AFSS location.

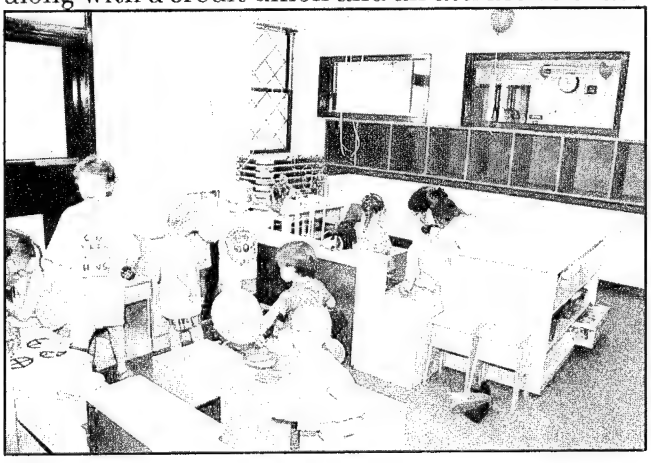
Internal Communications. FAA took a variety of steps to improve internal communications. Approaches used to inform employees and involve them in current developments included interactive "town hall" satellite broadcasts in which the Administrator and top managers discussed issues with personnel nationwide. The Administrator and Deputy Administrator also exchanged information and views with employees at a series of "brown bag" luncheon meetings. Fact sheets were issued to keep employees abreast of special interest topics, and a survey was conducted to assist in improving the agency's regular internal publications. Quarterly "flow-down" meetings provide information to top managers on cross-organizational issues.

Employee Occupational Safety and Health Program. In FY 1994, policy and oversight responsibility for this program was transferred to the Office of Environment and Energy. Airway Facilities was designated the lead for implementing the program. The agency developed procedures for comprehensive, systematic assessments of occupational safety and health compliance and initiated those assessments in two regions.

Child Care Centers. During FY 1994, FAA constructed and opened child care centers at three new sites: Southern California TRACON, Kansas City ARTCC, and Minneapolis ARTCC. The agency also approved 4 new sites--Boston, Chicago, Salt Lake City, and Washington. The selection of these sites will bring to 14 the number of child care centers which FAA has constructed or approved for construction at ARTCCs.

Child care centers are also under construction at the Western-Pacific and Northwest Mountain Regional Headquarters. These child care centers are in GSA space and are funded through GSA leaseback arrangements.

The new 213,000 square foot office building for the Southern Region includes a child care facility, along with a credit union and an attractive snack



Top Flight Kids Learning Center at Kansas City ARTCC opened June 29, 1994

bar run by the National Industry for the Severely Handicapped.

Alaska Housing Program. After completing an extensive market survey and cost analysis, the FAA's Alaskan Region purchased existing housing units in the villages of Cordova, Kotzebue and Yakutat. The homes will be refurbished for safety, comfort, and efficiency. This option was some $11 million less than the estimated cost of new construction. The high cost of leasing in Kotzebue will amortize the investment in that village in less than four years. One of the properties purchased in Yakutat also contained the outer marker site, which will save on lease costs for that navigational aid.

Other accomplishments were the transfer of the ownership of the FAA water and sewer systems to the community of Cold Bay and the impending transfer at the Cordova airport. Extricating the FAA from the utilities business at these remote villages provides significant cost savings to the agency and allows FAA personnel to concentrate on their primary responsibilities.

BUILDING A HIGHLY-SKILLED PROFESSIONAL WORKFORCE: SELECTING AND TRAINING EMPLOYEES FOR A CHANGING WORLD

Technical Training. The past year saw important innovations in instructional media, curricula and training management. A system for Operational Technical Training Needs Assessment (OTTNA) was set up within each line organization, a tuition pricing model was devised for training provided through the FAA Academy, and an inter-organizational Technical Training Resource Management Team (TTRMT) was established to work under the direction of the Executive Committee for Technical Training Oversight (ECTTO).

The FAA Academy is a key player in the agency's transition to distance delivered training including interactive video training (IVT) and computer-based instruction (CBI). In FY 1994, the FAA began the demonstration and validation of IVT. The Academy installed an uplink will install and an automated instructor presentation system in 1995. Initially, 38 receive sites will be established around the country. By the year 2000, the total receive sites will reach about 400, making IVT accessible to all FAA employees.

Courses are being identified that can be effectively converted to a teletraining format, instructors are being trained in distance teaching techniques, and -- next year -- courses will be conducted and evaluated.

Progress was also made in phasing in computer-based instruction (CBI). The Academy released two CBI courses on CD-ROM, distributed for use on the 1,000 CBI platforms which were set up at FAA sites during the year.

The Computer-Managed Instruction system was another FY 1994 release for use in distance learning courses. It makes assignments, tracks progress, prescribes further study or practice as needed, and reports completion of training. The system will be a component of our distant learning program at FAA field locations around the world. It is compatible with similar systems used by the airlines and airframe manufacturers, which increases the opportunities to exchange training with these organizations.

FAA organizations, working through the FAA Academy or contractors, oversaw the development of a number of new or revised courses, including:

- 130 hours of courseware for the Computerized Air Traffic Training System (CATTS)
- revision and delivery of cadre training courses in air traffic for on-the-job training and operational supervisors
- development of an IVT course on Cockpit En Route Inspection (Flight Standards)
- development of key components of a new curriculum for Aviation Safety Engineers, Aviation Safety Inspectors (Manufacturing), and Flight Test Pilots (Aircraft Certification).

Center for Management Development (CMD). The Center is heavily involved in assisting the FAA to develop strong labor-management partnerships. In FY 1994, CMD began to offer a new course called "The Partnership Challenge" designed for labor-management "pairs" -- people who actually deal with each other in the workplace and are committed to creating a more collaborative relationship. First to take the course were the Flight Standards management and PASS representatives and the Flight Service management paired with their NAATS representatives.

In keeping with the goals of the National Performance Review and the agency's efforts to downsize and streamline, the CMD entered into agreements with the Airway Facilities (AAF) and NAS Development (AND) organizations to develop customized team training. The AAF training is focused around team leaders and coaches in field facilities, while the AND effort emphasizes their integrated product teams.

CMD also devised a business plan which lays out its operations through the year 2000. The plan deals not only with its continuing role in serving the FAA's in-house training requirements but also with its potential role in serving other federal, state and local entities. Inherent in the business planning approach is the development of a comprehensive fee for service model for work done both within and outside the FAA.

Preparing/Selecting Managers for Senior Executive Service (SES). The FAA experienced a significant reduction in the number of senior managers in FY 1994. Replacements will come from the Candidate Development Program (CDP) which provides a systematic approach to identification, selection, career planning, and development of managers at the GS-14 and GS-15 levels. Competitively selected managers participate in an extensive development program to qualify them for the SES selection pool.

FAR Part 21 Training. The Aircraft Certification Service completed the development of a new course on the provisions and philosophy of FAR Part 21. The new course addresses why certification requirements exist; the history of Part 21; policy development; certificate management; international issues; enforcement; the relationship between type, production, and airworthiness certification; and the relationship of Part 21 to other FARs. Designed for FAA engineers, aviation safety inspectors, and flight test pilots, this course is available for industry and international student participation on a space available basis.

Aeromedical Education. The Civil Aeromedical Institute was granted approval by the Accreditation Council of Continuing Medical Education to provide continuing medical education credits to personnel participating in the Office of Aviation Medicine's education programs.

INTRODUCING NEW TECHNOLOGIES OF MANAGEMENT: ADDING NEW COMPUTER-AGE TOOLS FOR ENHANCED DECISION-MAKING

Third Party Draft System (TPDS). The TPDS is an automated system that issues drafts, in lieu of cash, for imprest fund transactions. Data entries on the TPDS automatically update the Departmental Accounting and Financial Information System (DAFIS), and reconcile drafts issued and cleared. Prototyped by the Western-Pacific Region, this new streamlined accounting process will permit significant reductions in imprest fund cash balances. During FY 1994, hardware and software were installed at all FAA accounting offices and TPDS was placed in use at three sites: the Aeronautical Center, Technical Center, and Washington Headquarters. It will begin operating in regional accounting offices in FY 1995 and at field offices thereafter.

Electronic Signature of Time and Attendance (T&A) Reports. Electronic signature allows supervisors to review and

certify T&A's using a personal computer. This eliminates the need to print, sign, mail, and store hard copy T&A's. It also eliminates the need for the payroll office to open, sort, file, and microfilm paper T&A's, resulting in Department-wide savings of $250,000 per year in contract costs. Certification of T&A reports through the use of electronic signature was successfully tested in the past year. Efforts to expand the use of electronic signature will continue during FY 1995.

Travel Management System. Plans were developed for a nationwide travel management system using the commercial software, Travel Manager (TM) Plus. Using a standard system will streamline administrative and accounting processes, and reduce the paperwork associated with processing and approving travel documents. Accomplishments during FY 1994 include installing Travel Manager Plus on the FAA headquarters Local Area Network (LAN) and establishing the support services. Plans are underway to test electronic signature and audit capabilities and to draft requirements for an interface with the Departmental Accounting and Financial Information System (DAFIS).

Fiscal Program Management. A new automated accounting process has helped Flight Standards Divisions, nationwide, significantly improve the use of their resources. This system provides both real time and planned expenditure information for comparison against funds authorized to accomplish the mission. Managers can quickly identify excess funds or deficiencies within a program and redirect them as priorities change.

Cost Activity Measurement System (CAMS). The Cost Activity Measurement System (CAMS) initiative was created by the FAA Management Board in FY 1993 to develop a means of associating cost with performance. It is a multi-phased initiative which will take in excess of three years to fully implement. Phase I, completed in September 1994, was a proof-of-concept designed to test whether existing data and systems could be used to compute the fully allocated per unit cost of FAA services at the field facility level. The per unit cost of Air Traffic services in the Southern Region, and Aircraft Certification and Flight Standards services in the Southwest Region were developed as prototypes.

Phase I provided managers with cost data in a previously unseen format, i.e. the fully allocated per unit cost of outputs produced. It did not, however, associate costs with the activities which incurred the costs both within and across organizations in producing those outputs. Phase II will remedy this by using a bottoms-up approach to associate activities with the outputs that they create, and then associate costs with those activities to arrive at the cost of producing the outputs. In this way, managers and other employees will be better able to understand the cost implications of producing outputs. This will give managers at all levels a tool to use in deciding the most effective way to utilize scarce resources, and will give other employees a fuller appreciation of the cost ramifications of how they do their jobs.

Activities Based Cost Accounting. In FY 1993, the Aircraft Certification Service developed a new system to help measure the costs of its products and services. Armed with this information, informed decisions can be made about which programs operate more efficiently than others. And, as resources become increasingly scarce, management will be better informed about how to reduce the cost of delivering these products and services. In early 1994, actual expenditures were allocated to 74 program activities and projects used in staffing standards data. The cost activities based accounting system is part of the pilot program for the FAA's Cost Activity Measurement System (CAMS).

Aircraft Certification Service Integrated Resource Information System (IRIS). Two major Aircraft Certification Service IRIS efforts were expanded during FY 1994. The Aircraft

Certification Office Subsystem (ACOS) was originally developed to assist Aircraft Certification Office managers make better management decisions. One major enhancement of ACOS is the addition of a Work Measures database. This database allows users to track and report work product counts on a biweekly basis by individual employee and may be automatically uploaded to both quarterly and annual engineer and flight test pilot staffing standards worksheets.

The Aircraft Certification Service Manufacturing Inspection Data Analysis System (MIDAS) is at the prototype stage. It will be an automated database system that tracks the resources (time and dollars) expended to complete Manufacturing Inspection District Office (MIDO) activities. One facet of the system will be the ability to tie the activities, with unique coded identifiers, into the staffing standards. Expenditures can then be compared to the aviation safety inspector staffing standards and analyzed over time.

Performance Enhancement System (PENS). PENS uses a "computerized notebook" to assist inspectors in decision making and increase the efficiency of their data collection activities. Inspectors can use the notebooks to collect data and research information while conducting on-site inspections or surveillance. PENS can be used to access FAA data bases and analyze data using cross-referenced regulations and guidance. On average, it will take less than 5 minutes to answer regulatory questions which can now take from 2 to 3 days to research manually. In early 1994, nine offices conducted a field study of PENS. Current research centers on additional field studies and human factors analysis of displays and advanced technologies.

Computerized Airmen Testing. The transition from written airmen testing to more economical and accurate computer testing surpassed the 50 percent mark. Computerized testing is now available in over 500 test sites within the U.S. and in six sites overseas. This expanded service represents the beginning of worldwide coverage and substantial savings in time and money. For example, the cost falls from $8 to $1 when computer testing is used, and the test results are immediately known.

Information Technology. The FAA has moved ahead in implementing its Corporate Systems Architecture (CSA) Capital Investment Plan Project. This venture is intended to guide the agency's design, acquisition and development of information technology. CSA is nearing completion of an Electronic Data Interchange business pilot which is designed to improve the quality, accessibility and security of data exchanged among FAA, DOT and the aviation industry and its suppliers.

The Computer Resource Nucleus (CORN) program has made progress in converting agency-wide administration applications to a single platform. CORN is one of the largest outsourcing efforts in the history of the federal government and has provided substantial cost savings and cost avoidance to the FAA by contracting out the corporate mainframe effort. Significant headway has been made in the development of the Operational Data Management System which is replacing obsolete operational and safety related systems such as the Aeronautical Information System.

Department of Transportation Communications Systems Consolidation. The FAA has been designated the lead agency to consolidate the DOT's voice and data networks. Three working groups representing a cross-section of modal agencies are at work examining (1) requirements, (2) network/system alternatives, and (3) operations and implementation. The requirements working group completed its work in September 1994 and submitted its findings to the Network Alternatives Working Group. This group will evaluate existing networks to determine the alternatives which could most completely satisfy DOT requirements. Overall project completion is scheduled for March 1, 1995.

Agency Data Telecommunications Network 2000 (ADTN2000). The FAA is replacing its existing Administrative Data Transmission Network (ADTN) with a more modern, open system design that will readily accommodate expected growth and the migration to new and emerging technologies. The new network will use Federal Telecommunications System 2000 (FTS2000) services for data transport and connectivity and will serve all domestic and international FAA sites.

ADTN2000 will provide better performance and expanded capabilities for access to computer resources and to support inter-networking with FAA local area networks (LAN), electronic mail systems, other FAA, government, and public networks. A contract to implement, operate and maintain the ADTN2000 network was awarded to Government Systems, Inc. (GSI). The contract will provide cost-efficient data transmission services for up to ten years. The contract also replaces aging equipment in FAA message centers and can provide video conferencing systems and services. Cutover and acceptance of the initial network are planned for April 1995.

CONTRIBUTING TO THE PUBLIC GOOD: FULFILLING OUR OBLIGATIONS TO THE COMMUNITY-AT-LARGE

External Communications. FAA last year placed renewed emphasis on providing the public and aviation community with timely information about programs and technical developments, and introduced new procedures to ensure appropriate responses to inquiries made under the Freedom of Information Act.

Americans With Disabilities Act. FAA provided guidance to airport operators and airlines on devices to assist passengers with disabilities in boarding commuter aircraft.

Historically Black Colleges and Universities (HBCU) Program. Approximately $1 million was awarded to Historically Black Colleges and Universities (HBCU) during FY 1994. The awards included Airway Science and Aviation Research grants as well as financial support for HBCU students enrolled in the Cooperative Education program.

Miles (Rick) Miller, a New England region air traffic controller, received the Secretary's award for valor. While on vacation in Ogunquit, ME, Mr. Miller saved a man and his young son from drowning.

Adopt-A-School Grant. With the assistance of the New England region's adopt-a-school program, the Linden Elementary School, Malden, MA, received a national science grant. A large portion of the funds was used to improve teacher understanding of science and aviation technology. Regional volunteers developed teacher workshops and outlines for career opportunities.

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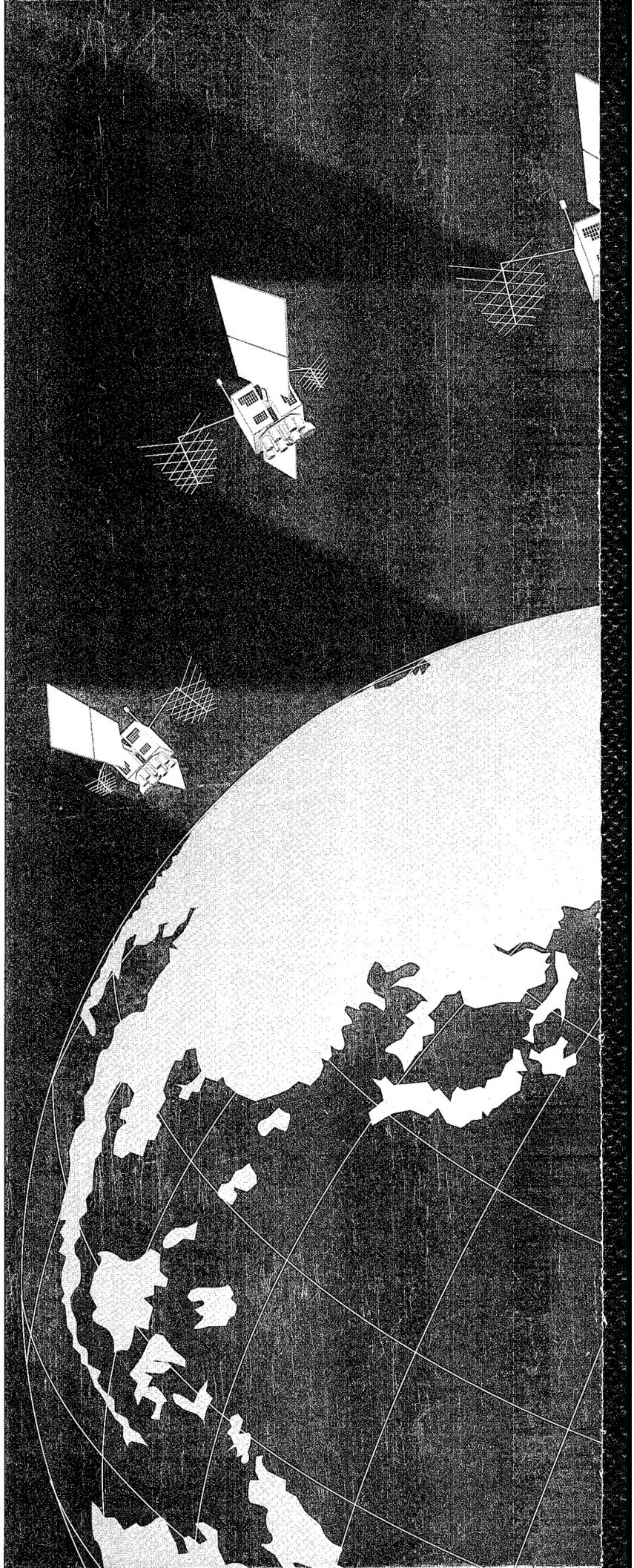
The Federal Aviation Administration also prepares comprehensive audited financial statements in accordance with the requirements of the Chief Financial Officers Act of 1990. The financial statements will be published separately upon completion of the audit by the Department of Transportation Office of the Inspector General. Recipients of the FAA Annual Report through distribution will automatically receive the financial statements when they are published. If you did not receive this report through distribution and want to obtain a copy of the financial statements, please indicate so on the enclosed comment card. or by writing to the Federal Aviation Administration, Financial Information Division, AAA-500, 800 Independence Ave. SW, Washington, DC 20591



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